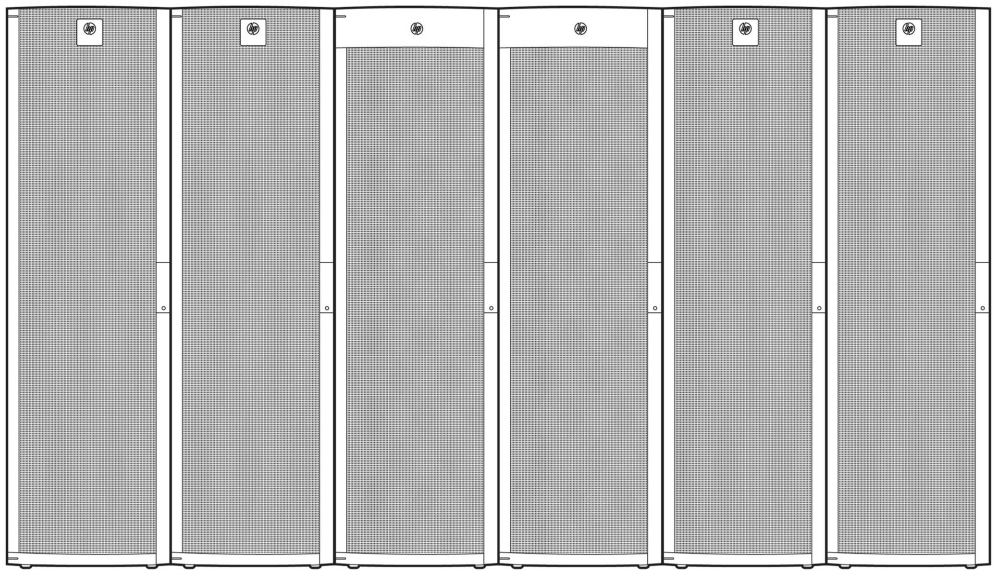
Overview

The HP XP P9500 Storage is bulletproof storage for mission-critical converged infrastructure where constant access to data is required-even in the event of a disaster. Designed for organizations that simply cannot afford any downtime, the XP P9500 combines a high-performance on-line scalable fully redundant hardware platform with unique data replication capabilities integrated with clustering solutions for complete business continuity. The XP P9500 can adapt to changing business conditions in minutes instead of months, and protect storage investments while increasing data center capacity and lifespan.

The HP XP P9000 Software Family decreases the complexities of critical data management. Through thin provisioning, organizations can improve storage utilization. Virtualization simplifies the management of diverse systems. Smart Tiers improve storage performance and controls costs. While consolidation becomes a reality by managing open systems, mainframe, and HP NonStop applications all on a single XP P9500.

With the HP XP P9500 Storage and XP P9000 Software Family, organizations can confidently manage their mission-critical IT.

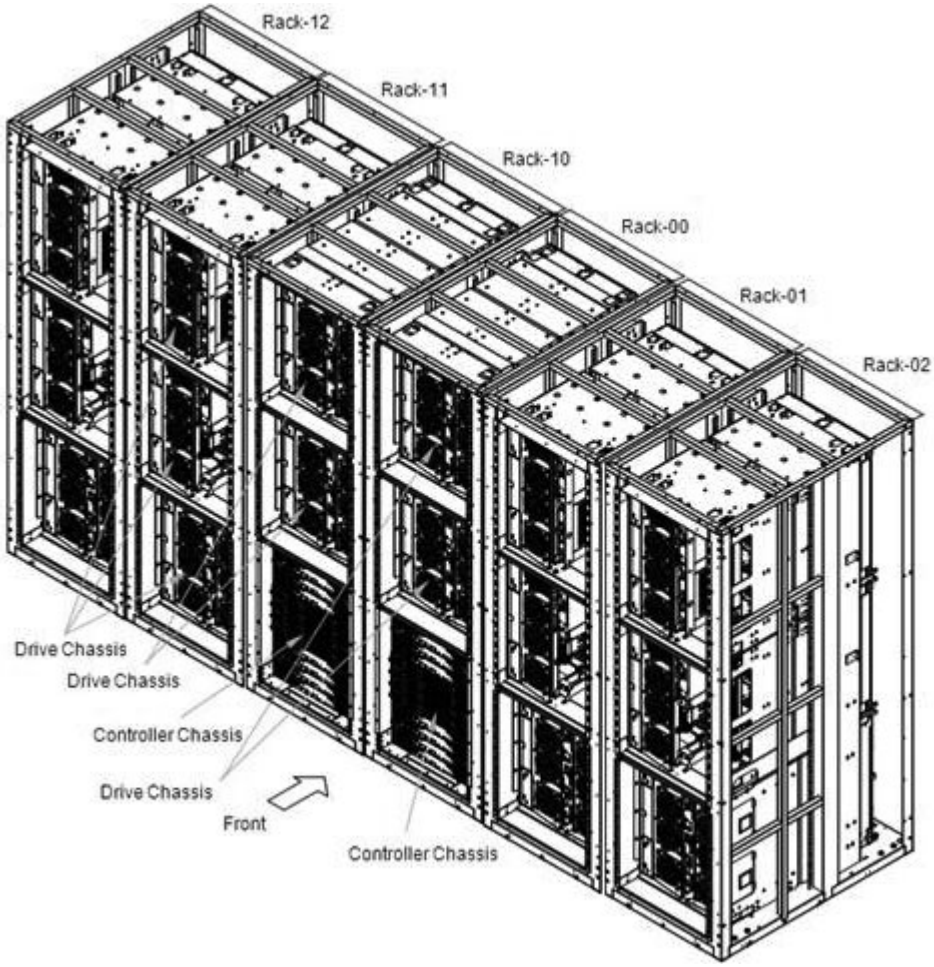


HP XP P9500 Storage

Overview

Scalability of the XP P9500			
	MIN	**INCREMENT**	**MAX**
Data Drives	4	4	2044
Spare Drives	1	1	128
Capacity	575 GB* raw 287 GB* usable	-	2 PB* raw 1.76 PB* usable
SAS Disk Adapter (DKA) Pairs	1	1	4
Channel Adapter (CHA) Pairs	1	1	10**
Host Ports	8	8/16	128/160**
Cache	16 GB	16 GB	1 TB
LDEVs	1	1	65,280
Racks	1	1	6

Standard Features



XP P9500 Hardware

The XP P9500 hardware consists of one or two DKC racks that will hold up to 256 drives each. Each DKC rack can attach to one or two optional DKU racks that each holds up to 384 drives. The DKC Rack contains the Controller Chassis and two 128 slot Drive Chassis or 48 slot Flash Module Chassis. The DKU Racks contain three 128 slot Drive Chassis or 48 slot Flash Module Chassis.

Standard Features

Channel Adapter (CHA) Pairs

Channel Adapters (CHA) pairs provide connections to host or servers that use the XP P9500 for data storage (either directly connected to the servers or through SAN switches). CHA pairs also provide connections to External Storage devices and to remote replication devices. CHAs are configured in pairs for redundancy. A minimum of 1 CHA pair is required. The maximum number of CHA pairs that can be installed in one DKC rack depends on the number of DKAs installed:

- Max 4 CHA pair with 2 DKA pairs installed
- Max 5 CHA pair with 1 DKA pair installed

CHA pairs available for use in the XP P9500 include:

- Fibre Channel-8 port 2-8 Gbps auto sensing Fibre Channel.
- Fibre Channel-16 port 2-8 Gbps auto sensing Fibre Channel.
- FCoE-8 port 10 Gbps
- FICON-16 port 1-4 Gigabit/sec auto sensing FICON short wave.
- FICON-16 port 1-4 Gigabit/sec auto sensing FICON long wave.
- FICON-16 port 2-8 Gigabit/sec auto sensing FICON short wave.
- FICON-16 port 2-8 Gigabit/sec auto sensing FICON long wave.

The Fibre Channel CHA pair uses SFP (small form factor pluggable) Transceivers on each port of the CHA. Each port is configurable as short wave or long wave by installing the appropriate transceiver. These CHA pairs ship with 8-Gbps short wave transceivers installed on every port.

Disk Adapter (DKA) Sets

The Disk Adapter (DKA) performs all data movement between the drives and Cache Memory. The DKA also provides data protection using RAID 1, RAID 5, and RAID 6.

The XP P9500 must have at least one and up to four DKA pairs installed

Cache Memory

Cache Memory is used to temporarily store data from the host until it is written to drive storage, or to stage data requested by the host from a drive. The XP P9500 contains global mirrored cache. All write data is written in cache twice, one time each on two separate SSD backed up Cache Memory Adapters. This insures that even if one cache board fails that the data is still in the other one until it is safely written a drive. Read data is not mirrored as a copy of that data remains on the drives, allowing more of the total cache capacity available for data.

XP P9500 Cache Memory can be configured into partitions allocated to particular host/port combinations to ensure that those hosts/ports enjoy optimized performance of cache-oriented I/O. These cache partitions are assigned to specified Array Groups. Up to 32 partitions of at least 4GB can be created in a XP P9500. Assigning cache in this way provides another method for tuning performance for data access for performance critical applications.

Standard Features

HDD / SSD Drives

The XP P9500 supports a variety of 2.5" small form-factor hard disk drives and solid state drives (SSDs). The number and type of drives installed in a XP P9500 is flexible. Disk drives must be added in groups of four. Additional capacity can be installed over time as capacity needs grow. All XP P9500 drives use the industry standard dual ported 6 Gbps SAS interface. Each drive is connected to both blades of the redundant DKA pair by separate connections. Spare drives are automatically used in the event of a drive failure.

SSDs have a limited number of writes that can occur before reaching the SSD's write endurance limit. The write endurance limit of MLC SSDs is generally lower than the limit of SLC SSDs, however this limit is generally high enough so wear out will not occur during the expected service life of an XP P9500 under the great majority of configurations, IO patterns, and workloads. The XP P9500 tracks all writes to MLC SSDs and can report the percent of the total write limit that has been used. This allows any SSD approaching the write limit to be proactively replaced before they are automatically spared out.

Flash Modules

The XP P9500 supports Flash Modules, which provide solid-state non-volatile high-performance data capacity. Flash Module capacity can be configured for use in the array in the same way as any other HDD or SSD. The number of Flash Modules that can be installed in a XP P9500 is flexible. Flash Modules must be added in groups of four. Additional capacity can be installed over time as capacity needs grow. Spare Flash Modules are automatically used in the event of a Flash Module failure.

Up to two 48 slot Flash Module Chassis may be configured to each DKC, and each Flash Module Chassis takes the place of one 128 slot Drive Chassis. Flash Module Chassis use the industry standard dual ported 6 Gbps SAS interface. Each Flash Module Chassis is connected to both blades of the redundant DKA pair by separate connections.

Service Processor

The Service Processor (SVP) manages the XP P9500 configuration, gathers statistical information, and is used for some maintenance activities.

The XP P9500 Storage does not require a functioning SVP in order to make capacity available for reading and writing. However, as external management functions have become dependent on the availability of the SVP in the XP P9500, some customers may desire to have fast recovery from an SVP failure by having a standby SVP. If the primary SVP fails, the hot standby SVP is switched into operation automatically within approximately six minutes.

The XP P9500 Continuous Track remote support functions require connection to HP Insight Remote Support via the internet.

Continuous Track Remote Support

The HP Continuous Track (C-Track) remote support solution uses internet connectivity to transmit heartbeats, system information messages (SIMs), and configuration information to the HP Storage Technology Centers (STCs) for remote data collection and remote monitoring purposes.

C-Track also enables the STCs to remotely diagnose certain issues that may exist on the XP P9500. With HP's secure remote device access, HP support personnel have the enhanced ability, in many cases, to quickly fix a support issue entirely through remotely performed actions.

Standard Features

Server connectivity

The XP P9500 connects to a variety of servers and operating systems. For details on which servers and operating systems are currently supported, please contact your resellers and your HP technical support to review the supported server and operating system information.

Switch support details

The XP P9500 connects to the leading Fibre Channel and FCoE switches in the industry today. For detailed information on supported switch configurations, please contact your sales representative.

Application Solutions

The HP XP P9500 Storage is a member of the HP XP P9000 Storage family. The XP P9500 is ideal for customers running Oracle, Microsoft, SAP, and VMware environments that simply cannot afford any downtime or tolerate any data loss.

The XP P9500 provides these mega-app environments with a complete hardware/ software storage solution to mitigate risks, lower costs, and accelerate business growth. Data replication and tightly integrated clustering solutions, along with disaster recovery support, enabling a multi-site disaster tolerant design to achieve business continuity in the most mission-critical environment.

The XP P9500 is the premier enterprise-class storage solution for database environments that demand a mission critical solution to meet business and storage demands of Oracle, Microsoft, SAP, and VMware environments with technology that helps drive business success and mitigates risk with constant data availability.

HP has developed an in-depth understanding of Oracle, Microsoft, SAP, and VMware technologies by extensive lab-testing best practices with the HP XP P9000 Storage, HP servers, and management software; high availability and disaster recovery solutions; and backup and recovery on the Oracle, Microsoft, and SAP application platforms. As a result, our customers can expect a wide range of operational and business benefits where they can:

- Maintain Hardware Redundancy. Every XP P9000 array is redundant, hot-swappable, and can be upgraded online.
- Achieve Data Loss Protection to monitor the array around the clock for unseen issues, and investigate and resolve problems proactively and immediately.
- Increase utilization efficiency and reduce storage costs with HP Thin provisioning.
- Increase return on investment with reduced cooling and power requirements along with increased reliability and storage density with HP SMART Tiering.
- Easily integrate to existing Oracle, Microsoft, SAP, and VMware environments with choice of FC, iSCSI, or SAS attached controllers.

To learn more about specific HP Storage Solutions that are built with Oracle, Microsoft, SAP, and VMware environments in mind, visit the solution sites supporting each of these applications.
HP Storage for Oracle hyperlink to: http://www.hp.com/storage/oracle
HP Storage for Microsoft hyperlink to: http://www.hp.com/storage/microsoft
HP Storage for SAP hyperlink to: http://www.hp.com/storage/sap
HP Storage for VMware hyperlink to: www.hp.com/go/vmware/storage

Standard Features

HP XP P9000 Software Products

The HP XP P9000 family offers a complete portfolio of software applications designed to help you confidently manage your XP P9500 Storage.

The software offerings can be grouped into several major categories as follows:

- Device and Configuration Management
- Performance Management
- High Availability and Replication
- Business Continuity Solutions
- Mainframe-connect Tools

For additional information regarding HP XP P9000 Software products, refer to the following:

- Trial licenses are available for most XP P9000 software products. Please contact your HP Sales Representative for details.
- For more information on XP P9000 Software, please refer to the HP 9000 Configuration and Ordering Guide. The HP9000, Integrity (Itanium based), and carrier-grade servers Configuration and Ordering Guide" is a comprehensive document which explains configuration and ordering information for servers and XP P9000 Storage.

What's New

- New HP XP P9000 Smart Manager for Mainframe Software
- **1.2TB 10K Hard Drive**
- **CVAE 7.6.1/7.6 Release** - Native Flash Identification, HDD/RAID Level mixed in Tier,Edit host group, Resource allocation cleanup
- **Replication Manager** - S-VOL delete with pair deletion
- **Tiered Storage Manager** - Tier/Pool level trend report

- New improved Command View AE Suite 7.5 -
  - SCVMM/PowerShell support for XP
  - Replication Manager - Improved remote pair usability with S-Vol
- New 800GB MLC SSDs
- Thin Provisioning & Smart Tiers enhancements -. Evaluate potential value of Smart Tiers with the monitoring functionality available in Thin Provisioning; Ability to specify utilization per tier in Smart Tiers
- Business Copy Snapshot - New Fast Snap, Copy-After-Write (CAW) snapshots significantly improves response time with faster writes; Support up to 1024 Snapshots and larger pools of up to 5PB
- Performance Advisor - Host group based reports; Smart Tiers related metrics; Alarms enhancements, FastSnap support
- HP XP P9000 Performance Accelerator software to give the HP XP P9500 Storage a significant performance boost
- Windows 8 connectivity support; RAID6 14D+2P support
- Tiered Storage Manager enhancements - Data placement profile feature.
- Online Data Migration capability - new capability enabling data migration from XP12000/XP10000, XP24000/XP20000 and P9500 to P9500 Storage completely non-disruptively, without any host downtime.
- 3 DC Open/MF Consistency Enhancement up to 12x12x12
- MF 3DC All Continuous Access Journal support.
- Encryption Key Management Server support.
- Mainframe enhancements - Support HPF function under TPF OS configuration

HP XP P9000 Command View Advanced Edition Software

Overview

HP XP P9000 Command View Advanced Edition software provides centralized, web-based management for XP P9000 Storage. It reduces total cost of ownership by enabling collaboration among team members and by increasing the efficiency of storage administrators. It can be used together with the Remote Web Console software shipped free with every HP XP P9500 Storage.

In an environment with many HP XP P9000 Storage, with complex replication, or with a need to migrate data among tiers of storage, HP XP P9000 Command View AE provides the device management capability you need. It allows you to manage multiple HP XP P9000 Storage from a central location. It provides the ability to install optional plug-in applications for enhanced functionality like visualizing complicated replication environments or non-disruptively migrating data between tiers of storage. HP XP P9000 Command View AE includes a Command Line Interface (CLI) to automate disk array configuration and management and includes an SMI-S provider to interface with SRM software.

XP P9000 Command View AE also includes the Provisioning Manager functionalities. Provisioning Manager was a separate product in the previous generation (XP) software portfolio. With XP P9000, Provisioning Manager product has been integrated with XP P9000 CVAE.
The CVAE CLI/SMI-S capabilities are conveniently included with the XP P9500 Storage Controller. There is also a native CLI/SMI-S included with the SVP for XP P9500 Storage. Refer to the Remote Web Console section for more details on the differences of the 2 CLI/SMI-S capabilities.

NOTE: XP P9000 Command View Advanced Edition for the XP P9500 Storage automatically supports External Storage, so the XP P9500 Storage does not require any special XP P9000 Command View Advanced Edition licenses to cover externally attached capacity.

Models

HP XP P9000 Command View Advanced Edition Software Base LTU	TB581AA
HP XP P9000 Command View Advanced Edition Software 1TB 0-30TB LTU	TB581AB
HP XP P9000 Command View Advanced Edition Software 1TB 31-50TB LTU	TB581AC
HP XP P9000 Command View Advanced Edition Software 1TB 51-100TB LTU	TB581AD
HP XP P9000 Command View Advanced Edition Software 1TB 101-250TB LTU	TB581AE
HP XP P9000 Command View Advanced Edition Software 1TB 251-500TB LTU	TB581AF
HP XP P9000 Command View Advanced Edition Software 1TB Over 500TB LTU	TB581AG
HP XP P9000 Command View Advanced Edition Software 1TB-Day Meter LTU	TB581AM

Product Highlights

- Includes Provisioning Manager functionalities.
- Wizard-based dialog modules for ease of use.
- Provides for seamless integration into higher-level infrastructure management utilities such as Storage Essentials.
- Centralized, multi-array health and status management for XP P9500, XP24000, XP20000, XP12000, and XP10000 arrays
- Flexible Administrative Security configuration
- Supports Graphical User Interface (GUI), and Command Line Interface (CLI)
- Integration with enterprise framework applications such as OpenView, Tivoli, and BMC
- Easy access from GUI to Remote Web Console by selecting physical view

Support

- See Service & Support section

Device and Configuration Management

Prerequisites

- XP P9000 Command View Advanced Edition Management Station (provided separately by customer). Please contact your HP Sales Representative for the latest details.
  - Windows Server 2008/32-bit and x64; Windows Server 2008 R2/x64; Windows 7/32-bit and x64; Windows Server 2003/32-bit and x64; Windows Server 2003 (SP1)/32-bit; Windows Server 2003 (SP2)/32-bit and x64; Windows XP Professional (SP2, SP3); Windows Vista/32-bit; Windows Vista (SP1)/32-bit; SuSE Linux 10/32-bit and x64; VMware, Hyper-V
  - 1 GHz CPU minimum, 2 GHz CPU or faster is recommended
  - 1 GB RAM minimum, 2 GB or greater is recommended
  - 4 GB free drive space minimum, 5 GB or greater is recommended
  - At least one Ethernet LAN card connected to network

Licensing

- For XP P9500 Storage: License-to-use is based on the total internal usable capacity of the XP P9500 being managed.
- As more LDEVs are configured in the array, additional licensing for XP P9000 Command View AE must also be purchased to cover the newly configured LDEVs.
- The HP XP P9000 Command View AE CLI SMI-S License is included with the XP P9500 Storage. It entitles you to use the SMI-S provider and the core command line interface (CLI) of HP XP P9000 Command View Advanced Edition Software. The core CLI has all the capabilities of the full CLI except the logical group commands. For more information about CLI features, see the HP XP P9000 Command View Advanced Edition software Device Manager CLI user guide. To install the HP XP P9000 Command View AE CLI SMI-S License, first obtain a license key using the registration number from the HP XP P9000 Command View AE CLI SMI-S License Entitlement Certificate. Next, install HP XP P9000 Command View AE using the Server Installation DVD from the media kit. Then install the CLI SMI-S license key (previously obtained) using the License button in the HP XP P9000 Command View AE web client login window. For installation instructions, see the HP XP P9000 Command View Advanced Edition software server installation and configuration guide for Device Manager. To use all the features of HP XP P9000 Command View Advanced Edition Software, purchase and install the HP XP P9000 Command View AE license.

Applications integrated with HP XP P9000 Command View AE

HP XP P9000 Tiered Storage Manager Software XP P9000 Command View AE Plug-in

Overview

HP XP P9000 Tiered Storage Manager is a plug-in application for XP P9000 Command View AE that transparently migrates XP P9000 data (including internal and externally connected) among storage tiers, seamlessly and without down time. It lets you take advantage of various storage tiers to better manage system cost and performance. XP P9000 Tiered Storage Manager includes the data migration functionality of XP P9000 Auto LUN.

When integrated with HP XP P9000 Performance Advisor, Tiered Storage Manager reports Array Group Busy Rates, allowing you to consider performance implications before migrating data.

NOTE: If you require automatic performance-based migration, purchase HP XP P9000 Auto LUN. HP XP P9000 Auto LUN includes data migration functionality and performance monitoring functionality. Only the data migration functionality of XP P9000 Auto LUN is included with HP XP P9000 Tiered Storage Manager.

Models

HP XP P9000 Tiered Storage Manager Software Base LTU	TB585AA
HP XP P9000 Tiered Storage Manager Software 1TB 0-30TB LTU	TB585AB
HP XP P9000 Tiered Storage Manager Software 1TB 31-50TB LTU	TB585AC

Device and Configuration Management

	HP XP P9000 Tiered Storage Manager Software 1TB 51-100TB LTU	TB585AD
	HP XP P9000 Tiered Storage Manager Software 1TB 101-250TB LTU	TB585AE
	HP XP P9000 Tiered Storage Manager Software 1TB 251-500TB LTU	TB585AF
	HP XP P9000 Tiered Storage Manager Software 1TB Over 500TB LTU	TB585AG
	HP XP P9000 Tiered Storage Manager Software 1TB-Day Meter LTU	TB585AM

Product Highlights

- Transparent migration - no need to disrupt or quiesce applications
- Non-disruptive to users
- Migrates data for both Internal or External Storage (MSA/EVA/XP P9000)
- Provide persistent volume classifications (Migration Groups)
- Provide easily customizable available storage pools (Storage Tiers)
- No limit to the number of Storage Tiers - Volumes can reside within multiple tiers
- Easy search operations for building Migration Groups and Storage Tiers
- Easy realignment to accommodate changes
- Migrations are batched together but are manually released
- Reports Array Group Busy Rates, when integrated with HP XP P9000 Performance Advisor. XP P9000 Performance Advisor v5.3 and XP P9000 Command View AE v7.3 provide the best combination of features and performance.

Support

- See Services/Support section

Prerequisites

- **Software**
  - HP XP P9000 Command View Advanced Edition Software

Licensing

- For the XP P9500 Storage: The License-To-Use is based on the sum of the total internal usable capacity of the XP P9500 Storage plus the configured usable capacity of all External Storage LUNs attached to the XP P9500 Storage.

HP XP P9000 Replication Manager Software

Overview

HP XP P9000 Replication Manager Software enables you to create, manage, and maintain HP XP P9000 Storage replication pairs. It provides centralized management of replication applications, decreases storage administration complexity, increases productivity, and improves service levels by providing a single enterprise view of the replication environment. It allows you to view replication status graphically in real time, improving your efficiency.

In addition to replication status, HP XP P9000 Replication Manager Software also provides early warning of impending problems. It eliminates tedious data entry that can cause outages and simplifies difficult replication tasks. In addition, it reduces costs and training expenses associated with replication management.

NOTE: HP XP P9000 Replication Manager only requires the CLI/SMI-S portion of XP P9000 Command View AE.

- Single visual point of management for all replication tasks
- Create, manage, and monitor Open Systems replication pairs, and monitor Mainframe replication pairs
- Makes managing replication easier for the Storage Administrator
- Manages and monitors local as well as remote replication pairs
- Reports pair status

Device and Configuration Management

- Displays the pair configurations relative to servers and subsystems
- Remote management of replication pairs
- Set up and control multi-site DR environments

Models	HP XP P9000 Replication Manager Software Base LTU	TB584AA
	HP XP P9000 Replication Manager Software 1TB 0-30TB LTU	TB584AB
	HP XP P9000 Replication Manager Software 1TB 31-50TB LTU	TB584AC
	HP XP P9000 Replication Manager Software 1TB 51-100TB LTU	TB584AD
	HP XP P9000 Replication Manager Software 1TB 101-250TB LTU	TB584AE
	HP XP P9000 Replication Manager Software 1TB 251-500TB LTU	TB584AF
	HP XP P9000 Replication Manager Software 1TB Over 500TB LTU	TB584AG

Product Highlights

- Replication Manager supports business continuity by simplifying replication management and monitoring
- Displays replication status, configuration and correlation of pair volumes
- Provides early warnings for any potential problems
- Eliminates tedious manual data entry

Support

- See Services/Support section

Prerequisites

- **Hardware**
  - HP XP P9000 Command View Advanced Edition Management Station - see HP XP P9000 Command View Advanced Edition Software section for details.
- **Software**
  - Requires the CLI/SMI-S portion of Command View AE. The full Command View AE implementation is not required. The CLI/SMI-S functionality can be obtained from any of the following:
    - HP XP P9500 Storage
    - HP XP P9000 Command View Advanced Edition

Licensing

Licensed per XP P9500 Storage. If customers want to manage all replication pairs (Business Copy pairs, Continuous Access pairs), XP P9000 Replication Manager licensed capacity must be greater than or equal to the sum of the purchased license capacities of the following replication products installed on that array: HP XP P9000 Business Copy, HP XP P9000 Continuous Access Sync, and HP XP P9000 Continuous Access Journal. However, if customers want to manage replication pairs belonging to a specific product only, say only Business Copy pairs, then Replication Manager license is needed only to cover the purchased license capacity of Business Copy.

Device and Configuration Management

HP XP P9000 Remote Web Console

Overview

Remote Web Console is shipped free of charge with the array firmware on the SVP. It is accessible by customers and provides basic single XP P9500 Storage management. It can be easily accessed by the XP P9000 Command View AE GUI. If Remote Web Console is used as the only array device manager, it is accessed via a remote IP URL to the SVP. (See user manual for more details). Also note that the SVP shipped with XP P9500 Storage includes a native CLI/SMI-S provider.

NOTE: There are 2 separate CLI/SMI-S providers shipped with XP P9500 Storage now - SVP CLI/SMI-S provider and CVAE CLI/SMI-S provider. The SVP CLI/SMI-S provider is included with the SVP. The CVAE CLI/SMI-S provider is shipped as a part of XP P9500 Storage Controller and is included on a separate CVAE media kit.

Users of XP P9500 Storage should use the new SVP SMI-S. The SVP SMI-S will continue to be enhanced and is the recommended provider for the XP P9500. The CVAE SMI-S will also support the XP P9500 Storage but will primarily be maintained for XP24000 and older arrays. CVAE SMI-S will be maintained with bug fixes but in general will not be enhanced beyond CVAE 7.0 unless there are specific business cases.

At initial release of the XP P9500 Storage, the CVAE SMI-S provider is slightly more complete at SMI-S 1.4 with support for the Thin Provisioning Profiles while the SVP SMI-S is at 1.3 and does not implement the Thin Provisioning Profiles, but unless there is something supported by CVAE SMI-S that is needed, the XP P9500 SMI-S provider should be used.

CVAE SMI-S is what is referred to as a "proxy" SMI-S provider since it resides on a separate server that is not an integral part of the array. When the Array itself implements the SMI-S such as it is with is on the XP P9500 SVP, it is referred to as an "embedded" provider. The industry trend is toward embedded providers. In general they should provide better overall response times and do not suffer as much from synchronization issues as proxy providers. For example the CVAE SMI-S data, comes out of the CVAE database which as we know can have synchronization lags with the array.

Models

No product or license is required to be ordered, it comes free with the XP P9500 firmware on the SVP.

Licensing

No license key required, product is pre-enabled and comes free with every XP P9500 Storage.

HP XP P9000 Array Manager Software

Overview

HP XP P9000 Array Manager Software provides web-based volume management, resource allocation, access control, and data security for your XP P9500 Storage. Configure and manage data volumes for most effective use of your XP P9500. Partition array resources to isolate applications, reserve cache memory for your most frequently accessed data, and control host port usage so that your most critical applications have the port bandwidth they need. Configure, manage, and secure all host access to the XP P9500 so that you have efficient access to your data. Create read-only volumes for archiving and data retention, and securely delete your data when necessary.

NOTE: HP XP P9000 Array Manager Software is a required product for all XP P9500 Storage implementations, except for Mainframe-only environments.

Models

HP XP P9000 Array Manager Software Base LTU	TB514AA
HP XP P9000 Array Manager Software 1TB 0-30TB LTU	TB514AB
HP XP P9000 Array Manager Software 1TB 31-50TB LTU	TB514AC
HP XP P9000 Array Manager Software 1TB 51-100TB LTU	TB514AD
HP XP P9000 Array Manager Software 1TB 101-250TB LTU	TB514AE

Device and Configuration Management

HP XP P9000 Array Manager Software 1TB 251-500TB LTU	TB514AF
HP XP P9000 Array Manager Software 1TB Over 500TB LTU	TB514AG
HP XP P9000 Array Manager Software 1TB-Day Meter LTU	TB514AM

Product Highlights

HP XP P9000 Array Manager provides several important capabilities. The following table lists the functions included in XP P9000 Array Manager.

Function Name	Supported Systems	Description
LUN Manager	Open Systems	Add paths, delete paths, set host mode, set/reset command device, configure ports, create LUNs and assign them to ports, configure port security, prevent IOSCAN by unauthorized servers from finding secure LUNs, and check every I/O for proper security.
Open Volume Manager	Open Systems	Create expanded volumes that are larger than standard volumes (also called LU Size Expansion or LUSE), and create custom size volumes that are smaller than standard volumes (also called Custom Volume Size or CVS).
Virtual LVI for Mainframe	Mainframe	Create custom size mainframe volumes that are smaller than standard volumes. Also called Custom Volume Size or CVS.
Data Retention Utility	Open Systems	Volume access control, enabling archiving and data retention. Protect key data sets from being updated, copied, accessed, or queried. Also known as LUN Security XP Extension.
Cache Residency Manager	Open Systems	Improve performance by reserving areas of Cache Memory for frequently accessed data. Also known as Cache LUN.
Cache Residency Manager for Mainframe	Mainframe	Improve performance by reserving areas of Cache Memory for frequently accessed data. Also known as Hitachi Flash Access for Mainframe and Cache LUN for Mainframe.
Volume Retention Manager for Mainframe	Mainframe	Volume access control, enabling archiving and data retention.Assign access permissions (read/write, read only, and protect) to mainframe volumes..
Volume Security for Mainframe	Mainframe	Volume security for mainframe attached XP Disk Arrays that protects volumes from access by unauthorized hosts.
Volume Security Port Security Option	Mainframe	Specify disk array ports through which hosts can access volumes.
Performance Control	Open Systems	Allocate disk array port I/Os and transfer rate so that your most important applications have the performance they need. Also known as Server Priority Manager.
Performance Monitor	Both	Monitor usage, workload, and performance of drives, volumes, processors, and host interfaces in the XP P9500 Storage. View the information in graphical formats
Volume Shredder	Both	Securely delete data with repetitive overwrites to minimize the likelihood that it could be recovered. Overwrite up to eight times with random or user selected patterns. Also known as Data Shredder.

RAID Manager	Open Systems	Host based command line interface that controls XP P9000 Continuous Access, XP P9000 Business Copy, and Data Retention Utility (LUN Security XP Extension).
Cache Partition	Both	Improve performance by reserving areas of cache to store frequently accessed data. Divide Cache into up to 32 partitions and configure dedicated Cache for critical applications to improve their performance.
P9000Info (Previously known as XPInfo)	Open Systems	Understand the mapping between device files on the server and their associated storage ports and LDEVs in the XP P9500 by using the P9000Info command line utility.

In summary, HP XP P9000 Array Manager Software provides the following capabilities:

- Add or delete I/O paths
- Configure Host ports
- Create expanded LUNs
- Create custom size volumes (Mainframe and Open Systems)
- Establish volume host access permissions (Mainframe and Open Systems)
- Partition parity groups, cache, and host ports
- Control port bandwidth available to hosts
- Create read-only volumes for archiving and data retention (Mainframe and Open Systems)
- Reserve cache memory for frequently accessed data (Mainframe and Open Systems)
- Securely delete data (Mainframe and Open Systems)
- Automate array configuration and management tasks using the bundled in XP P9000 Command View AE CLI
- Interface with SRM software platforms using the bundled in XP P9000 Command View AE SMI-S provider

Support

- See Service & Support section

Licensing

- See Capacity-Licensed XP P9000 Software section
- For the XP P9500 Storage, license-to-use is based on the total internal usable capacity of the array(NOTE: The licensed capacity must cover all internal usable capacity, whether the capacity is composed of Open Systems volumes or Mainframe volumes or a combination of both. Also, note that you do not need to purchase XP P9000 Array Manager licenses to cover external storage capacity.)

NOTE: Command View AE CLI SMI-S provider is bundled with XP P9500 Storage. It is no longer bundled with XP P9000 Array Manager.

Device and Configuration Management

HP XP P9000 Thin Provisioning Software

Overview

HP XP P9000 Thin Provisioning Software allows you to supply storage capacity to your applications from a pool of virtualized storage. By enabling you to allocate your anticipated future storage capacity needs from virtual storage, HP XP P9000 Thin Provisioning Software reduces the amount of physical drive capacity initially required. As utilization of physical drive space increases over time, you can purchase more drive capacity as it is needed, and install it without affecting your applications. By removing the guessing from capacity planning, HP XP P9000 Thin Provisioning reduces the cost of volume management.

Models

HP XP P9000 Thin Provisioning Software Base LTU	TB527AA
HP XP P9000 Thin Provisioning Software 1TB 0-30TB LTU	TB527AB
HP XP P9000 Thin Provisioning Software 1TB 31-50TB LTU	TB527AC
HP XP P9000 Thin Provisioning Software 1TB 51-100TB LTU	TB527AD
HP XP P9000 Thin Provisioning Software 1TB 101-250TB LTU	TB527AE
HP XP P9000 Thin Provisioning Software 1TB 251-500TB LTU	TB527AF
HP XP P9000 Thin Provisioning Software 1TB Over 500TB LTU	TB527AG
HP XP P9000 Thin Provisioning Software 1TB-Day Meter LTU	TB527AM

Product Highlights

- Reduce costs
  - Reduce initial acquisition costs
  - Improve drive capacity utilization
  - Reduce storage purchases over the life of the storage system by eliminating stranded storage (storage that is allocated but unused)
  - Reduce Total Cost of Ownership by deferring storage purchases
- Reduce management cost
  - Simplify storage provisioning - reduce time and resources required to perform storage provisioning by only allocating storage once
  - Eliminate application service interruptions - perform volume expansion and deletion without host downtime
  - Deploy applications faster - planning and sizing storage for applications is easier
  - Virtualize both Open and Mainframe environments now with Thin Provisioning support for Mainframe.
- Reduce environmental impact
  - Reduce power consumption, cooling requirements and carbon footprint by delaying purchases of drives
  - Conserve floor space with better drive utilization
  - Supports both Open systems and Mainframe systems.

Support

- See Service & Support section

Licensing

- License to use is based on the total capacity of the thin provisioning pool.
- Licensing follows a band-based structure. This is different from the licensing structure of XP Thin Provisioning, which follows a block-based structure.

Device and Configuration Management

HP XP P9000 Array Manager With Thin Provisioning Software

Overview	HP XP P9000 Array Manager With Thin Provisioning Software is a bundle of XP P9000 Array Manager and XP P9000 Thin Provisioning products. It allows the customers to purchase both the titles at a significant discount as compared to buying both the products separately.	
Models	HP XP P9000 Array Mgr with Thin Prov Software Base LTU	TB524AA
	HP XP P9000 Array Mgr with Thin Prov Software 1TB 0-30TB LTU	TB524AB
	HP XP P9000 Array Mgr with Thin Prov Software 1TB 31-50TB LTU	TB524AC
	HP XP P9000 Array Mgr with Thin Prov Software 1TB 51-100TB LTU	TB524AD
	HP XP P9000 Array Mgr with Thin Prov Software 1TB 101-250TB LTU	TB524AE
	HP XP P9000 Array Mgr with Thin Prov Software 1TB 251-500TB LTU	TB524AF
	HP XP P9000 Array Mgr with Thin Prov Software 1TB Over 500TB LTU	TB524AG
	HP XP P9000 Array Mgr with Thin Prov Software 1TB-Day Meter LTU	TB524AM
Product Highlights	Refer to XP P9000 Array Manager and XP P9000 Thin Provisioning sections	
Support	See Service & Support section	
Licensing	1TB LTU of the bundle provides 1TB LTU of Array Manager and 1TB LTU of Thin Provisioning. License to use is based on the licensing model of the individual products.	

HP XP P9000 External Storage with Thin Provisioning Software

Overview	HP XP P9000 External Storage with Thin Provisioning Software is a bundle of XP P9000 External Storage and XP P9000 Thin Provisioning products. It allows the customers to purchase both the titles at a significant discount as compared to buying both the products separately.	
Models	HP XP P9000 External Storage with Thin Provisioning Software Base LTU	TB526AA
	HP XP P9000 External Storage with Thin Provisioning SW 1TB 0-30TB LTU	TB526AB
	HP XP P9000 External Storage with Thin Provisioning SW 1TB 31-50TB LTU	TB526AC
	HP XP P9000 External Storage w/Thin Provisioning SW 1TB 51-100TB LTU	TB526AD
	HP XP P9000 External Storage w/Thin Provisioning SW 1TB 101-250TB LTU	TB526AE
	HP XP P9000 External Storage w/Thin Provisioning SW 1TB 251-500TB LTU	TB526AF
	HP XP P9000 External Storage w/Thin Provisioning SW 1TB Over 500TB LTU	TB526AG
	HP XP P9000 External Storage w/Thin Provisioning SW 1TB-Day Meter LTU	TB526AM
Product Highlights	Refer to XP P9000 External Storage and XP P9000 Thin Provisioning sections.	
Support	See Service & Support section	
Licensing	1TB LTU of the bundle provides 1TB LTU of External Storage and 1TB LTU of Thin Provisioning. License to use is based on the licensing model of the individual products.	

Device and Configuration Management

HP XP P9000 Array Manager Suite

Overview	HP XP P9000 Array Manager Suite is a bundle of XP P9000 Array Manager, XP P9000 Thin Provisioning and XP P9000 External Storage products. It allows the customers to purchase all the three titles at a significant discount as compared to buying the three products separately.	
Models	HP XP P9000 Array Manager Suite Base LTU	TB544AA
	HP XP P9000 Array Manager Suite 1TB 0-30TB LTU	TB544AB
	HP XP P9000 Array Manager Suite 1TB 31-50TB LTU	TB544AC
	HP XP P9000 Array Manager Suite 1TB 51-100TB LTU	TB544AD
	HP XP P9000 Array Manager Suite 1TB 101-250TB LTU	TB544AE
	HP XP P9000 Array Manager Suite 1TB 251-500TB LTU	TB544AF
	HP XP P9000 Array Manager Suite 1TB Over 500TB LTU	TB544AG
	HP XP P9000 Array Manager Suite 1TB-Day Meter LTU	TB544AM
Product Highlights	Refer to XP P9000 Array Manager , XP P9000 Thin Provisioning sections and XP P9000 External Storage	
Support	See Service & Support section	
Licensing	1TB LTU of the bundle provides 1TB LTU of Array Manager and 1TB LTU of Thin Provisioning and 1TB LTU of External Storage. The Suite is licensed by total usable(internal + external) capacity.	

HP XP P9000 Smart Tiers Software

Overview	HP XP P9000 Smart Tiers improves storage performance and controls costs by transparently migrating data to appropriate tiers of storage within the HP XP P9500 Storage. Smart Tiers manages data in thin provisioning pools. It monitors performance at the page level and can migrate the data online to a different tier, automatically or manually, based on policies. Smart Tiers supports up to three tiers per pool. Smart Tiers supports external storage, which allows users to setup inexpensive external storage as one of the storage tiers for infrequently accessed data. RAID 1, RAID 5 and RAID 6 are supported	
Models	HP XP P9000 Smart Tiers Software Base LTU	TB516AA
	HP XP P9000 Smart Tiers Software 1TB 0-30TB LTU	TB516AB
	HP XP P9000 Smart Tiers Software 1TB 31-50TB LTU	TB516AC
	HP XP P9000 Smart Tiers Software 1TB 51-100TB LTU	TB516AD
	HP XP P9000 Smart Tiers Software 1TB 101-250TB LTU	TB516AE
	HP XP P9000 Smart Tiers Software 1TB 251-500TB LTU	TB516AF
	HP XP P9000 Smart Tiers Software 1TB Over 500TB LTU	TB516AG
	HP XP P9000 Smart Tiers Software 1TB-Day Meter LTU	TB516AM

Product Highlights

- Improve Performance
  - Frequently accessed data is always in the fastest tier. Highly utilized Thin Provisioning pages are relocated to the fastest drives in the pool.
  - Tier relocation is performed periodically, either automatically or manually based on performance monitoring algorithm.
- Optimize resource utilization
  - Expensive fast tiers of storage are always holding the most frequently accessed data only
  - Pages are allocated to upper tiers as long as the performance potential of each tier (group of pool volumes) is not exceeded.
  - Enhanced tiering policy for migrating pages between tiers for better resource utilization
  - Drive coexistence in a Tier. Supports multiple tiers for external storage
- Reduce management cost

- Set data migration policies for continued enhanced performance, saving on management time to keep the XP P9000 at its optimal performance.
- Option setting enables detailed setting of Tier Management, Cycle Time, and Monitoring Period.
- Supports both Open systems and Mainframe systems.

Support
- See Service & Support section

Prerequisites
- As Smart Tiers works with Thin Provisioning pages, XP P9000 Thin Provisioning is a required product for Smart Tiers.

Licensing
- License to use is based on the total capacity of the thin provisioning pool managed by Smart Tiers

HP Data Retention Utility (also known as LUN Security XP Extension)

Overview

HP Data Retention Utility provides a web-based highly secure method of LDEV access control, allowing a storage administrator to protect critical data for archiving or data retention purposes. It can help a storage administrator manage business critical or sensitive data.

NOTE: Purchase and deployment of this product does not by itself ensure that regulatory/legal requirements for data retention will be met and compliance is not implicitly or explicitly guaranteed.

Models

Included with HP XP P9000 Array Manager. See section for more information

Product Highlights
- Create read-only volumes
- Protect data from being replicated
- Allow data to be read only by authorized applications
- Protect datasets from write and read access
- Protect datasets from query/IO scan/file system inquiry operations
- Allow data to be locked down for a specific retention time period
- " Host Agent integration using XP P9000 RAID Manager

Support
- See Service & Support section

Prerequisites
- **Software**
  - XP P9000 RAID Manager version 1.24.13 (required for host agent integration)

Licensing
- See Capacity-Licensed XP P9000 Software section

HP XP P9000 External Storage Software

Overview

HP XP P9000 External Storage allows you to host XP P9500 Storage LUNs on select external storage subsystems. XP P9000 External Storage allows you to tier storage capabilities and provision a XP P9500 solution to optimize return on IT investment - letting you focus high-performance/high availability native XP P9500 Storage capacity against your most mission-critical data while hosting less critical data on cost optimized external storage subsystems. Data stored on external devices connected behind a XP P9500 appear to a server to be stored inside the XP P9500.

XP P9000 External Storage provides significant consolidation scalability - up to 255 Petabytes (PB) of external storage can be configured behind a single XP P9500 Storage. Coupled with the significant cost advantages that external storage systems can provide, you can confidently scale your XP P9500 solution to simplify configuration complexity and reduce ongoing management cost. XP P9000 External Storage is compatible with a wide range of XP P9000 software tools, including XP P9000 Business Copy for local replication, XP P9000 Continuous Access for remote replication, and XP P9000 Auto LUN for performance optimization.

Note that the XP P9000 External Storage licenses do not include partitioning licenses because partitioning is included in XP P9000 Array Manager. In addition, XP P9000 External Storage licenses do not need to include Array Manager licenses because Array Manager is licensed only on the internal capacity of the XP P9500 Storage. Array Manager to-be-licensed quantity is not affected by presence or absence of externally attached storage.

Models

HP XP P9000 External Storage Software Base LTU	TB506AA
HP XP P9000 External Storage Software 1TB 0-30TB LTU	TB506AB
HP XP P9000 External Storage Software 1TB 31-50TB LTU	TB506AC
HP XP P9000 External Storage Software 1TB 51-100TB LTU	TB506AD
HP XP P9000 External Storage Software 1TB 101-250TB LTU	TB506AE
HP XP P9000 External Storage Software 1TB 251-500TB LTU	TB506AF
HP XP P9000 External Storage Software 1TB Over 500B LTU	TB506AG
HP XP P9000 External Storage Software 1TB-Day Meter LTU	TB506AM

Product Highlights

- Petabytes of external storage capacity
- Interoperability with XP P9000 Business Copy, XP P9000 Continuous Access, XP P9000 Auto LUN, Cache LUN, XP P9000 Performance Advisor, and Data Retention Utility
- External Storage health/status information (via Remote Web Console or XP P9000 Command View AE)
- Support for HP MSA 1000/1500 disk systems, EVA Disk Arrays, XP Disk Arrays and XP P9000 Storage
- Support for HDS, EMC, and IBM disk arrays for data migration or permanent attach (requires a local support agreement). Please contact your HP Sales Representative for the latest details

Support

- See Service & Support section

Prerequisites

- **None**

Licensing

- For XP P9500 Storage: Sufficient license capacity must be purchased to cover the usable configured LUN capacity of all externally connected arrays. See Capacity-Licensed XP P9000 Software section for more details.

Device and Configuration Management

HP XP P9000 Resource Partition Software

Overview

HP XP P9000 Resource Partition allows role based access control of XP P9500 resources. It allows storage administrators to partition XP P9500 resources, at Physical and logical level and to assign these resources to sub-administrators while retaining overall control. Administrators can partition a XP P9500 Storage at a physical level (ports, hosts, LDEVs and Parity Groups) and dedicate part of their arrays for specific requirements. They can also partition at a logical level (Host Groups and LDEVs) and keep Ports, Parity Groups and External Storage as a shared infrastructure.

HP XP P9000 Resource Partition software is ideal for a multi-tenant environment set up where dedicated sub-administrators need to manage the IT infrastructure needs of their respective business units. At the same time, it allows the datacenter administrator retain complete control of XP P9500 Storage resources. Datacenter administrators can decide to partition XP P9500 Storage resources either at a logical level to improve storage utilization efficiency or at a physical level to improve quality of service and avoid data and access breaches across multiple tenants.

Models

HP XP P9000 Resource Partition SW LTU TB518A

Product Highlights

- Assign role based access controls to sub-administrators to modularize IT infrastructure management, even with a central IT infrastructure resource pool.
- Useful for cloud service providers and for organizations with consolidated IT infrastructure, providing a platform to multiple tenants to host storage and charging as per usage.
- Maximize XP P9500 Storage resource utilization with shared resources such as Ports, Parity Groups and External Storage, and dedicated resources such as host groups and LDEVs, with logical partitioning of XP P9500 Storage.
- Create resource groups based on the needs of your customers or business units, helping to ensure that quality of service and data secrecy requirements are met with hardware based partitioning.

Support

- See Service & Support section

Prerequisites

- None

Licensing

- A frame license is available for XP P9500 Storage.

HP XP P9000 Cache Partition

Overview

Improve performance by reserving areas of cache to store frequently accessed data. Divide Cache into up to 32 logical partitions and configure dedicated Cache for critical applications to improve their performance.

Models

Included with HP XP P9000 Array Manager - see section for more details

Product Highlights

Isolate applications by subdividing the XP P9000 Storage cache into smaller independent partitions

Support

See Service & Support section

Licensing

License-to-use for unlimited storage capacity on one XP P9500 Storage

Device and Configuration Management

HP XP P9000 Data Shredder (also known as Volume Shredder)

Overview HP XP P9000 Data Shredder is a software product designed for the enterprise storage market and is supported on the XP P9500. It helps IT staff by securely deleting data on the XP P9500 Storage via successive overwrites to minimize the likelihood that the deleted data could be restored. This may help to promote peace of mind and improved data security for high security environments that use the XP P9500. It will be most useful for sensitive financial data or high security data in a variety of industries.

Models Included with HP XP P9000 Array Manager - see section for more information.

Product Highlights

- Overwrites data volumes up to 8 times
- User selectable overwrite patterns
- Ease of use
- Verification that overwrites have been completed
- Percentage of completion display
- Abort feature to stop the process

Support See Service & Support section

Licensing License-to-use for unlimited storage capacity on one XP P9500 Storage

HP XP P9000 DKA Encryption Software

Overview XP P9000 DKA Encryption software enables the encryption capability for all the data that stored on the internal drives of the XP P9500 Storage. The Enhanced DKA encrypts the data on drives so that data cannot be read off a drive that is removed from the XP P9500. Only data on the drives is encrypted (data in cache is not encrypted).

Models HP XP P9000 DKA Encryption Software LTU TB501A

Support See Service & Support section

Licensing License-to-use for unlimited storage capacity on one XP P9500 Storage

HP XP P9000 Performance Advisor Software

Overview

HP XP P9000 Performance Advisor Software is a web-based application for collecting, monitoring, and displaying the performance of your XP P9000 Storage. With XP P9000 Performance Advisor, you choose the time and duration of performance data collection-so you can pinpoint activities that significantly affect your XP P9000 and tune the array accordingly. You can easily monitor storage performance and display usage statistics for your storage system at any level, from a complete system overview down to individual components. You can also filter hosts, arrays, and array components, so you are only seeing the hosts and arrays you want to see. You can also generate, schedule and view detailed performance reports that will allow you to identify any performance bottlenecks in your XP P9000 Storage.

Performance Advisor integrates with HP XP P9000 Tiered Storage Manager, providing Array Group performance data. This allows Tiered Storage Manager to monitor access patterns so that you can consider performance implications before migrating data.

Models

HP XP P9000 Performance Advisor Software Base LTU	TB590AA
HP XP P9000 Performance Advisor Software 1TB 0-30TB LTU	TB590AB
HP XP P9000 Performance Advisor Software 1TB 31-50TB LTU	TB590AC
HP XP P9000 Performance Advisor Software 1TB 51-100TB LTU	TB590AD
HP XP P9000 Performance Advisor Software 1TB 101-250TB LTU	TB590AE
HP XP P9000 Performance Advisor Software 1TB 251-500TB LTU	TB590AF
HP XP P9000 Performance Advisor Software 1TB Over 500TB LTU	TB590AG
HP XP P9000 Performance Advisor Software 1TB-Day Meter LTU	TB590AM

NOTE: The HP XP P9000 Performance Advisor Base License includes the media kit.

Product Highlights

- Real time data gathering and analysis
- System view of all array resources
- Dashboard for quick review of XP P9500 performance status
- Macro view of applications to quickly isolate and troubleshoot performance problems
- Graphical presentation of array component metrics in form of charts
- Enhanced troubleshooting
- Metrics for other products running on XP array like Thin Provisioning , Smart Tiers, CA
- Detailed performance report generation and scheduling
- Flexible event notification and large 320 GB historical repository
- Multi-OS support
- Multiple management stations support
- Coexistence of Windows-based host agent and Windows-based management station on the same server (not recommended for large configurations)
- XP P9000 Storage External Storage performance monitoring
- Integrates with HP XP P9000 Tiered Storage Manager (Requires Performance Advisor and HP XP P9000 Command View AE. Performance Advisor and Command View AE provide the best combination of features and performance.)

Support

- See Service & Support section

Prerequisites

- **Management Station** for standalone deployment (provided separately by customer)
  - Management Server on its own management station
    - Supports single core, dual-core, and quad-core processors
  - Windows Server 2003 R2 Standard and Enterprise Edition (SP1, SP2)/32-bit and 64-bit; Windows Server 2003 Standard and Enterprise Edition (SP1, SP2)/32-bit and 64-bit; Windows Storage Server 2003 R2, Windows XP Professional (SP2, SP3)/32-bit; Windows Vista/32-bit;

Windows Vista (SP1)/32-bit; Windows 2008/32-bit; Windows 2008 (SP1, SP2)/32-bit; Windows 2008 R2/32-bit and 64-bit; VMware; Hyper-V; XEN. Refer to the Support Matrix for all supported platforms.
  - 3-GHz CPU, 4-GHz CPU (recommended for large configurations > 2GB database)
  - 2 GB RAM (minimum), 4 GB RAM (recommended for large configurations > 2GB database)
  - 10 GB free drive space (minimum), 320GB free drive space (for maximum history detail)
  - NTFS
  - DVD drive
  - VGA monitor with 256 colors or better
  - At least one LAN Card
- **Host Agent:** refer to the HP XP P9000 Performance Advisor Installation Guide
- **Minimum Array Firmware** - refer to the release notes associated with the particular version of Performance Advisor

Licensing

- For XP P9500 Storage, License-to-use is based on total installed internal usable capacity. External storage LUNs do not need to be considered.
  - As more LDEVs are configured, additional licenses for XP P9000 Performance Advisor much also be purchased.
- See Capacity-Licensed XP P9000 Software section for more details.

HP XP P9000 Performance Accelerator Software

Overview

HP XP P9000 Performance Accelerator Software helps customers boost performance of their HP XP P9000 Storage. Performance Accelerator software improves the random I/O performance of the HP XP P9500 Storage. This improved performance helps customers achieve higher return on their investment. Performance Accelerator software is a licensed software that works by enabling the functionality on the HP XP P9500 firmware.

Models

HP XP P9000 Performance Accelerator Software TB521A

Product Highlights

- Improves random I/O performance on XP P9500 Storage

Prerequisites

- **Hardware:** HP XP P9500 Storage
- **Minimum Array Firmware -**V04a or late r

Licensing

- License-to-use is a frame based licenses that enables Performance Accelerator Software on the entire XP P9500 Storage..

Performance Management Software

HP Storage Essentials Performance Edition

Overview

HP Storage Essentials Performance Edition provides single-pane-of-glass performance management for the SAN - from the application, through the SAN infrastructure, to XP P9500, and EVA Disk Arrays.

Two products are provided: a 150 MAP version designed for the EVA environment, and a 300 MAP version designed for the XP P9000 Storage environment. The 150 MAP product includes the Storage Essentials media kit, 150 MAPs, one MAL for Storage Essentials Database Viewer or Exchange Viewer, and the EVA Storage Essentials Performance Pack. The 300 MAP product includes the Storage Essentials media kit, 300 MAPs, one MAL for Storage Essentials Database Viewer or Exchange Viewer, and the Storage Essentials Performance Pack Enterprise (for the XP P9000 Storage).

NOTE: A MAP is a Managed Access Port. The MAP count is essentially a count of the Fibre Channel ports in your SAN. A MAL is a Managed Application License. It provides linkage to applications like Microsoft Exchange, Oracle database, Sybase, Microsoft SQL, DB2, Informix and InterSystems Caché.

NOTE: The 150 MAP product is compatible with the EVA and will not work with the XP P9000 Storage. The 300 MAP product is compatible with the XP P9000 Storage and will not work with the EVA.

HP Storage Essentials Performance Edition complements the HP XP P9000 Performance Advisor product. XP P9000 Performance Advisor provides detailed performance information for XP P9000 Storage, while HP Storage Essentials Performance Edition provides performance metrics for the SAN.

For more information about HP Storage Essentials Performance Edition, please refer to: http://www.hp.com/go/SEPE

Models

HP Storage Essentials Performance Edition provides the option to receive your licenses electronically. "eDelivery" provides fast installation. The eDelivery product numbers are indicated by the "E" suffix appended to the product number.

HP Storage Essentials Performance Edition 150 MAP SW LTU eDelivery	T4661AAE
HP Storage Essentials Performance Edition 300 MAP SW LTU eDelivery	T4662AAE

Product Highlights

- Coverage of SAN
- Discover, display and map physical & virtual elements from application to array
- Isolate elements on the path causing performance issues
- Monitor performance of XP P9500, XP and EVA Disk Arrays from a single pane of glass
- Performance and configuration reports
- Backend visibility of external storage connected to the XP P9000 Disk Arrays
- Historical data and trends for performance analysis

Support

Storage Essentials Performance Edition will not have support for XP P9500 Storage at launch. XP P9500 Storage is planned to be supported soon after launch. Please refer to: http://www.hp.com/go/SEPE for updated support information.

Prerequisites

- HP Storage Essentials Software Media Kit
- Dedicated management station

Licensing

License-to-use for unlimited storage capacity on one XP P9500, XP, or EVA Disk Array.
For information about MAP and MAL licensing, please refer to: http://www.hp.com/go/SEPE

Performance Management Software

HP XP P9000 Performance Control

Overview

HP XP P9000 Performance Control is a web-based performance allocation tool for XP disk arrays. It lets you align IT priorities with storage performance resources and allows these resources to be intelligently allocated to hosts. It lets you prioritize critical systems by making sure that they have all the XP disk array performances they need to meet business objectives. You can also ensure that business processes (like backups and data warehouse loads) get the array bandwidth they need to complete within targeted time windows. XP P9000 Performance Control enables sophisticated service provider solutions based on performance level quality-of-service. Because it ensures that array resources are best used, it improves ROI of your XP disk array solution.

Models

HP XP P9500 Storage
Included with HP XP P9000 Array Manager - see section for more information.

Product Highlights

- Set Upper Limit function to cap performance on non-priority hosts
- Set Threshold Value function to relax policies when priority host performance consumption is low
- Set WWN and Port level settings
- Determine IOPS or MB/s settings for random or sequential I/O-oriented processing workloads
- Define Host Bus Adapter names to allow intuitive naming of hosts
- Define Host Bus Adapter group names to allow intuitive naming of hosts

Support

See Service & Support section

Licensing

License-to-use for unlimited storage capacity on one XP Disk Array

HP XP P9000 Auto LUN Software

Overview

HP XP P9000 Auto LUN Software provides web-based automatic monitoring and load balancing for all your XP P9500 Storage. Now you can make the most of your arrays by moving high-priority tasks to underutilized volumes, replicating volumes for backup and recovery, and viewing the health of your arrays. You set performance goals, you set the limits, and XP P9000 Auto LUN does the rest. It proposes a migration plan and even estimates how much your storage performance will improve when it is done. XP P9000 Auto LUN lets you evaluate array usage and determine whether resources are overloaded or out of balance. Use its easy-to-follow menus to define when data is collected and arrays are monitored. It makes spotting trends simple, using up to 90 days of stored historical data to create up-to-the-minute reports. You can even export data to third-party analysis tools like Microsoft Excel. If resources are overloaded, XP P9000 Auto LUN will create a plan to move volumes, then stands by for your approval to make changes.

Models

HP XP P9000 Auto LUN Software Base LTU	TB515AA
HP XP P9000 Auto LUN Software 1TB 0-30TB LTU	TB515AB
HP XP P9000 Auto LUN Software 1TB 31-50TB LTU	TB515AC
HP XP P9000 Auto LUN Software 1TB 51-100TB LTU	TB515AD
HP XP P9000 Auto LUN Software 1TB 101-250TB LTU	TB515AE
HP XP P9000 Auto LUN Software 1TB 251-500TB LTU	TB515AF
HP XP P9000 Auto LUN Software 1TB Over 500TB LTU	TB515AG
HP XP P9000 Auto LUN Software 1TB-Day Meter LTU	TB515AM

Product Highlights

- Identifies data volumes stressed by high I/O workloads
- Moves high priority data to underutilized array volumes
- Creates a volume migration plan
- Migrates data across different drives or RAID levels
- Virtually assures successful volume migration with "Never Give Up" mode option

Support

See Service & Support section

Performance Management Software

Licensing	See Capacity-Licensed XP P9000 Software section

HP XP P9000 Cache LUN (also known as Cache Residency)

Overview	HP XP P9000 Cache LUN lets you reserve areas of memory cache on your HP XP P9500 Storage to store frequently accessed information. It improves file access times and enables faster data transfers. Assigning information to on-board cache speeds up access to your data because cache-resident data is available at host data transfer speeds for both read and write operations. XP P9000 Cache LUN redirects I/O requests from the XP P9500 drives to data locked in the array's cache. It is transparent, it is simple to implement, and the performance gains it delivers are immediate.
Models	Included with HP XP P9000 Array Manager - see section for more information
Product Highlights	• XP P9500 Storage Firmware based • Lock data in cache memory • Flexible user configuration • Scalable
Support	See Service & Support section
Licensing	See Capacity-Licensed XP P9000 Software section

HP XP P9000 Business Copy Software

Overview

HP XP P9000 Business Copy makes nearly instantaneous copies of data from XP P9500 Storage for development, testing or backup, without ever interrupting your online production. XP P9000 Business Copy creates and maintains RAID-protected copy volumes without interrupting access to the source volumes. Because it makes asynchronous copy volume updates, copies stay up to date with minimal I/O response time degradations for your primary applications. These copy volumes can at any time be "split" from their corresponding source volume and accessed by other applications. Therefore, while copy volumes are being utilized, primary applications can continue to access and update their source volumes as needed, without taking a performance hit. By creating multiple online copies of critical business data without disrupting your business, XP P9000 Business Copy lets you get the most from your data.

Snapshot XP P9000 is a feature of Business Copy that also replicates data volumes. However, it is slightly different in that it makes space-efficient secondary copies that might only be a fraction of the size of the primary copy. Only data that is about to be overwritten in the primary volume is written to the secondary volume. This is called Copy-on-Write. As a result, if the volume capacity required for Snapshot XP P9000 can be smaller, then the cost of replication can be lowered. Snapshot is recommended for application environments where the I/O to the secondary volume is not write-centric or intensive (reads or writes).

These secondary copies are also known as "virtual volumes", or V-VOL. All V-VOLs reside in a snapshot pool, or POOL-VOL, which is sized based on the number of V-VOLs and the IO ratio of the primary volumes associated with these V-VOLs.

Models

HP XP P9000 Business Copy Software Base LTU	TB513AA
HP XP P9000 Business Copy Software 1TB 0-30TB LTU	TB513AB
HP XP P9000 Business Copy Software 1TB 31-50TB LTU	TB513AC
HP XP P9000 Business Copy Software 1TB 51-100TB LTU	TB513AD
HP XP P9000 Business Copy Software 1TB 101-250TB LTU	TB513AE
HP XP P9000 Business Copy Software 1TB 251-500TB LTU	TB513AF
HP XP P9000 Business Copy Software 1TB Over 500TB LTU	TB513AG
HP XP P9000 Business Copy Software 1TB-Day Meter LTU	TB513AM

Product Highlights

- Real time local data mirroring
- Enables a wide range of data protection and recovery solutions
- Instant access to copied volumes
- New Fastsnap Copy-After-Write (CAW) Snapshots significantly improve P-VOL response times compared to legacy COW (Copy On Write) Snapshots
- Support for up to 1024 Snapshots per P-VOL with Fast Snap (up from 64)Create up to nine concurrent copies using full-capacity replicas, up to sixty-four concurrent copies using Snapshot partial-capacity replicas
- Host Agent integration using XP P9000 RAID Manager
- Includes licenses for Business Copy for Mainframe, providing local replication for mainframe volume types

Support

See Service & Support section

Prerequisites

- **Software**
  - XP P9000 RAID Manager (required for host agent integration). RAID Manager is included in XP P9000 Array Manager.

Licensing

See Capacity-Licensed XP P9000 Software section. Licensing is based on the sum of all P-VOLs, S-VOLs (full copies) and POOL-VOL (Snapshot copies)

HP System Copy Software for SAP

NOTE: HP has discontinued System Copy for SAP Software effective 1st August 2011. For customers that require copying an SAP system using array-based replication technology, HP recommends using the procedures provided in the following SAP webpage - http://www.sdn.sap.com/irj/sdn/systemcopy

HP XP P9000 Continuous Access Software

Overview

The HP XP P9000 Continuous Access family of high availability data and disaster recovery tools enable real-time data mirroring between XP P9500 Storage. They provide continuous availability for all your important data and protect you from catastrophic failures. XP P9000 Continuous Access products deliver host-independent, array-based remote recovery for a wide range of open systems environments. XP P9000 Continuous Access provides high-performance remote mirroring in high-workload environments. Using shared mirroring and host-connect interfaces, you will better utilize your array resources. In addition, with seamless integration into a full spectrum of remote mirroring-based solutions, XP P9000 Continuous Access can be deployed for activities ranging from data migration to high-availability server clustering.

XP P9000 Continuous Access Synchronous, the base product, provides replication using a synchronous link between XP P9500 Storage. XP P9000 Continuous Access Journal provides replication using an asynchronous link between XP P9500 Storage. XP P9000 Continuous Access can be used to copy data between XP P9500 Storage and between XP Disk Arrays of different generations. For up to date information on XP P9000 Continuous Access compatibility between XP P9000/XP Disk Array generations, please contact your HP representative.

NOTE: The XP P9000 Continuous Access Journal includes XP P9000 Continuous Access Synchronous license.

Models

XP P9000 Storage Continuous Access Synchronous LTUs	
HP XP P9000 Continuous Access Synchronous Software Base LTU	TB511AA
HP XP P9000 Continuous Access Synchronous Software 1TB 0-30TB LTU	TB511AB
HP XP P9000 Continuous Access Synchronous Software 1TB 31-50TB LTU	TB511AC
HP XP P9000 Continuous Access Synchronous Software 1TB 51-100TB LTU	TB511AD
HP XP P9000 Continuous Access Synchronous Software 1TB 101-250TB LTU	TB511AE
HP XP P9000 Continuous Access Synchronous Software 1TB 251-500TB LTU	TB511AF
HP XP P9000 Continuous Access Synchronous Software 1TB Over 500TB LTU	TB511AG
HP XP P9000 Continuous Access Synchronous Software 1TB-Day Meter LTU	TB511AM
XP P9000 Storage Continuous Access Journal LTUs	
HP XP P9000 Continuous Access Journal Software Base LTU	TB578AA
HP XP P9000 Continuous Access Journal Software 1TB 0-30TB LTU	TB578AB
HP XP P9000 Continuous Access Journal Software 1TB 31-50TB LTU	TB578AC
HP XP P9000 Continuous Access Journal Software 1TB 51-100TB LTU	TB578AD
HP XP P9000 Continuous Access Journal Software 1TB 101-250TB LTU	TB578AE
HP XP P9000 Continuous Access Journal Software 1TB 251-500TB LTU	TB578AF

High Availability and Data Replication Software

	HP XP P9000 Continuous Access Journal Software 1TB Over 500TB LTU	TB578AG
	HP XP P9000 Continuous Access Journal Software 1TB-Day Meter LTU	TB578AM
	XP P9000 Storage Continuous Access Conversion LTU's (Used to convert from XP P9000 Continuous Access Sync to XP P9000 Continuous Access Journal) See Capacity-Licensed XP P9000 Software section for usage details	
	HP XP P9000 Continuous Access Conversion Software Base LTU	TB523AA
	HP XP P9000 Continuous Access Conversion Software 1TB 0-30TB LTU	TB523AB
	HP XP P9000 Continuous Access Conversion Software 1TB 31-50TB LTU	TB523AC
	HP XP P9000 Continuous Access Conversion Software 1TB 51-100TB LTU	TB523AD
	HP XP P9000 Continuous Access Conversion Software 1TB 101-250TB LTU	TB523AE
	HP XP P9000 Continuous Access Conversion Software 1TB 251-500TB LTU	TB523AF
	HP XP P9000 Continuous Access Conversion Software 1TB Over 500TB LTU	TB523AG

Product Highlights

- Remote data mirroring between XP P9500/XP Disk Arrays
- Enables a wide range of remote mirroring solutions
- XP P9000 Continuous Access Synchronous: Synchronous copy mode
- XP P9000 Continuous Access Journal: Asynchronous copy mode using drive-based Journal file
- Fast failover/failback for seamless, reliable mirroring recovery
- Provides data consistency for Open/Mainframe VOLs in a Multi-DKC 3 Data center multi-target configuration
- Supports 3DC Continuous Access Journal x Continuous Access Journal configuration
- Host Agent integration using XP P9000 RAID Manager
- XP P9500 Storage XP P9000 Continuous Access Sync includes licenses for Continuous Access Synchronous for Mainframe, providing synchronous remote replication for mainframe volume types
- XP P9500 Storage XP P9000 Continuous Access Journal includes licenses for Continuous Access Synchronous for Mainframe, Continuous Access Journal for Mainframe, and Cont Access Journal 3DC & 4x4 for Mainframe, providing asynchronous journal-based remote replication for mainframe volume types

Support See Service & Support section

Licensing See Capacity-Licensed XP P9000 Software section

HP XP P9000 RAID Manager

Overview HP XP P9000 RAID Manager provides OS-specific, host based software initiated from a server via a command line interface that allows full user control of HP XP P9000 Continuous Access and HP XP P9000 Business Copy from the host server. XP P9000 RAID Manager also provides functionality for synchronized operation with cache and OS, etc. If launching from a host using scripts, a consulting engagement may be recommended. XP P9000 RAID Manager also provides host agent/command support for HP Data Retention Utility (LUN Security XP Extension) based solutions (see Data Retention Utility for more information).

Models Included with XP P9000 Array Manager N/A

Product Highlights

- Host-resident integration of XP P9000 Software

Support

- See Service & Support section

Licensing

- NA: product provided at no charge

High Availability and Data Replication Software

HP Secure Path (for HP-UX, Windows)

Overview

See HP Secure Path QuickSpecs for detailed information on this offering:
http://h18006.www1.hp.com/products/sanworks/secure-path/specifications.html

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Hitachi HDLM for VMware
Hitachi HDLM for IBM AIX
Hitachi HDLM for Sun Solaris
Hitachi HDLM for Windows
Hitachi HDLM for Linux

Overview

Hitachi HDLM for VMware, Hitachi HDLM for IBM AIX, Hitachi HDLM for Sun Solaris, Hitachi HDLM for Windows, and Hitachi HDLM for Linux are server-based software tools that provide I/O path failover and load balancing for your XP P9000s. They offer load balancing to improve performance, while the software's automatic error detection features provide a fault-tolerant infrastructure to avert data stoppages or catastrophic halts. It automatically routes I/Os to an alternate path, and administrators see and manage all I/O activity via an easy-to-use graphical interface - while users see only reliable system performance.

Models

Hitachi HDLM Media Kit	HIT5208A
Hitachi HDLM for VMware 1 Server LTU	HIT5211A
Hitachi HDLM for VMware Unlimited Server LTU	HIT5212A
Hitachi HDLM for IBM AIX 1 Server LTU	HIT5209A
Hitachi HDLM for IBM AIX Unlimited Server LTU	HIT5210A
Hitachi Dynamic Link Manager (HDLM) for Sun Solaris 1 Server LTU	HIT5206A
Hitachi Dynamic Link Manager (HDLM) for Sun Solaris Unlimited Server LTU	HIT5207A
Hitachi Dynamic Link Manager for Windows 1 Server LTU	HIT5202A
Hitachi Dynamic Link Manager for Linux 1 Server LTU	HIT5204A

Product Highlights

- Supports wide range of operating systems - Supports path failover and load balancing for VMware, IBM AIX, Microsoft Windows, SUN Solaris, and Linux operating systems
- Offers fault-tolerant path management - manual or automatic failover and failback, automated path health checks, multiple active paths allowing bandwidth control at the HBA port level , dynamic LUN addition and deletion without a server reboot, easy installation and operation through auto-discovery function

Support

- See Service & Support section

Licensing

- HDLM Media Kit includes installers for all operating systems. However, installation services for each operating system must be purchased separately.
- For 1 Server LTU: License-to-use on a single server/XP P9500 Storage pair. Example: if you have two XP P9500 Storage and ten servers, all using Hitachi HDLM for IBM AIX, you would need 20 of the 1 Server LTUs.
- For Unlimited Server LTU: License-to-use with unlimited servers connected to a single XP P9500 Storage. Example: if you have two XP P9500 Storage and ten servers, all using Hitachi HDLM for IBM AIX, you would need two of the Unlimited Server LTUs.
- If a server has multiple partitions, a copy of HDLM is required for every partition that will be using HDLM. For example, if you have a server with 2 partitions and both partitions require HDLM, then you would need two of the 1 Server LTUs or one Unlimited Server LTU.

HP Metrocluster with XP P9000 and XP Continuous Access

Overview

HP Metrocluster with XP P9000 and XP Continuous Access seamlessly integrates XP P9000 Storage remote replication capabilities with HP Serviceguard on HP-UX. It provides automatic and bi-directional failover/failback of business critical data and applications between data centers. HP Metrocluster with XP P9000 and XP Continuous Access supports XP P9000 Storage in a Two Data Center configuration.

When combined with the HP Continentalclusters product, HP Metrocluster with XP P9000 and XP Continuous Access can also be used to replicate data and to perform application recovery across three data centers using the following storage devices: XP P9500, XP24000, XP20000, XP12000, and XP10000.

For more information, please refer to: http://www.hp.com/go/dt.

Models

HP Metrocluster with XP P9000 and XP Continuous Access B8109CA

Product Highlights

- Extends protection provided by a Serviceguard cluster to cover disasters that affect the whole data center.
- Functions as an automatic failover/failback disaster recovery solution for HP Serviceguard on HP-UX.
- When combined with the HP Continentalclusters product, provides the ability to replicate data across three data centers (with XP P9500, XP24000, XP20000, XP12000 and XP10000 Disk Arrays) resulting in minimal Recovery Point Objective (RPO) / Recovery Time Objective (RTO). This configuration provides protection against widespread disasters that may affect an entire region.

Support

Please contact your HP representative for details

Prerequisites

Software

- HP-UX 11i v1 or higher. The 3 Data Center capability is available only on HP-UX 11i v2 or higher.
- HP Serviceguard
- XP P9000 Continuous Access (XP P9000 Continuous Access Sync, or XP P9000 Continuous Access Journal)
- XP P9000 RAID Manage

Licensing

One license needed for every clustered environment

Business Continuity Solutions

HP Continentalclusters

Overview

HP Continentalclusters software provides the highest levels of disaster tolerance by eliminating the cluster itself as a single point of failure. It uses data replication technologies to provide application recovery across multiple widely separated HP-UX Serviceguard clusters.

The Continentalclusters product provides the ability to monitor a Serviceguard cluster and recover mission-critical applications to a remote Serviceguard cluster, should the monitored cluster become unavailable or if there is a disaster at the cluster site. Continentalclusters allows for a semi-automatic push button type of recovery. When a cluster failure or a site disaster is detected, Continentalclusters generates a notification. An operator, upon receipt of a notification, can start the recovery of applications at a recovery cluster using a single Continentalclusters command that automates the recovery procedure. Continentalclusters supports mutual recovery across two clusters. In a mutual recovery pair, each cluster is configured to recover the mission-critical applications running in the other cluster.

Applications can be configured in Continentalclusters for disaster tolerance using HP XP P9500 Storage and HP XP P9000 Continuous Access data replication technology.

For more information, please refer to: http://www.hp.com/go/dt.

Models

HP Continental Clusters LTU T2346BA

Product Highlights

- Continentalclusters supports recovery of single instance applications like Oracle over LVM, VxVM and CVM/CFS 4.1.
- Continentalclusters supports recovery of multi-instance applications like Oracle RAC over SLVM and CVM/CFS 4.1.

Support

Please contact your HP representative for details

Prerequisites

Software

- HP-UX 11i v1 or higher (For more information, please refer to: http://docs.hp.com)
- HP Serviceguard (11.17 or higher for CFS/CVM 4.1 support)
- HP Metrocluster with XP P9000 Continuous Access

Licensing

- One license of Continentalclusters covers two pairs of clusters (Primary and Recovery). Use Option 888 (designed for use with HP Metrocluster with XP P9000 Continuous Access).
- Each license of Continentalclusters requires one license of HP Metrocluster with XP P9000 Continuous Access.

HP XP P9000 Cluster Extension Software

Overview

HP XP P9000 Cluster Extension Software offers protection against system downtime to critical applications for enterprise customers using the HP XP P9000 Storage family. It allows for hands-free failover/failback of server-storage system. It detects failures and automatically manages recovery without human intervention, offering comprehensive disaster tolerance against application downtime from fault, failure, or site disaster. HP XP P9000 Cluster Extension Software resurrects your critical applications at a remote site within seconds/minutes after a failover event over both metropolitan and global distances. XP P9000 Cluster Extension works seamlessly with your open-system clustering software, HP XP P9000 Continuous Access Software and your XP P9500 Storage system to provide a highly available IT system.

NOTE: Similar functionality exists for HP-UX servers with HP Metrocluster software.

Models

HP XP P9000 Cluster Extension Software Windows LTU	TB534A
HP XP P9000 Cluster Extension Software Linux LTU	TB535A

Product Highlights

- Automatic failover/failback recovery solution for native clusters on Red Hat and SUSE Linux, Microsoft Cluster Service (MSCS) for Windows
- Seamless integration of remote mirroring with server clusters
- Fully scripted turnkey solution for disaster recovery on Linux and Widows

Support

See Service & Support section

Prerequisites

Software

- XP P9000 Continuous Access Synchronous (required for synchronous copy mode-integrated solution)
- XP P9000 Continuous Access Journal (required for asynchronous copy mode-integrated solution)
- XP P9000 RAID Manager (required for host agent integration)

Licensing

License-to-use on a per server basis. One License required for each server running XP P9000 Cluster Extension Software.

HP XP P9000 External Storage Access Manager Software

Overview

HP XP P9000 External Storage Access Manager (ESAM) ensures extreme high availability of host applications used in XP P9500 storage. XP P9000 External Storage Access Manager provides protection against the loss of application availability when input and output (I/O) failures occur in the primary XP P9500 storage by automatically switching host applications from the primary XP P9500 storage to the secondary XP P9500 storage

XP P9000 External Storage Access Manager is supported on XP P9500 storage

Models

HP XP P9000 Ext Storage Access Mgr SW LTU	TB519A

Product Highlights

- Transparent array failover from primary XP P9500 to secondary XP P9500 storage
- Host application is not affected in case of I/O failure on primary XP P9500
- Movement of the storage in case of failure, not the host

Prerequisites

- HP XP P9000 Continuous Access Synchronous
- Hitachi HDLM - One copy for each server
- HP XP P9000 External Storage software - 1TB

Licensing

License-to-use for unlimited storage capacity on one XP P9500 Storage

HP XP P9000 Virtualization Adapter

Overview

HP XP P9000 Virtualization Adapter (XP P9000 Virtualization Adapter) provides an interface between VMware Site Recovery Manager (SRM) and HP XP P9000 Storage. The interface enables SRM to provide automatic access to remote data copies when virtual machines become unavailable locally.

XP P9000 Virtualization Adapter supports XP P9500, XP24000/XP20000, XP12000/XP10000 Disk Arrays.

For additional information, please visit hp.com at the following URL:
http://www.hp.com/go/storage/vmware

Product Highlights

HP XP P9000 Virtualization Adapter performs the following functions for SRM:

- Discovers disk arrays
- Discovers replicated LUNs
- Fails over storage for testing (test a recovery plan)
- Fails over storage for recovery (execute a recovery plan)

Prerequisites

- Servers with VMware Site Recovery Manager
- XP P9000 Continuous Access Synch and/or XP P9000 Continuous Access Journal installed on both the local and remote XP P9500 Storage
- RAID Manager 1.24.13 or later (to support XP P9500 Storage)

Optional: XP P9000 Business Copy installed on both the local and the remote XP P9500 Storage

Licensing

The XP P9000 Virtualization Adapter is provided as a free download. Visit:
http://www.hp.com/go/storage/vmware

HP Data Protector Software

Overview

HP Data Protector Software allows you to reduce backup windows and facilitates high-availability of data and systems. Backups are performed on the copy of the production data; with the option to copy it or move it to tape. This solution, totally integrated into Data Protector, is called Zero Downtime Backup and provides continuity of business operations in 24x7 mission-critical environments. Data Protector fully automates this process, and makes it easy to manage replicated data through a simple GUI.

Instant Recovery takes Zero Downtime Backup a step further, meeting the demands of the most complex enterprises for specific recovery time and recovery point objectives, and enables critical data to be recovered within minutes.

For more information about Data Protector Software please visit hp.com at the following URL:
http://www.hp.com/go/dataprotector.

HP DBUtil

Overview

HP DButil is a command-line utility to facilitate application-consistent replication of a Microsoft SQL Server database. HP DButil commands place the database in a transactionally consistent state and suspend write operations while HP replication software is used to copy the database. Other HP DButil commands then resume the database and normal write operations. HP DButil now supports Microsoft SQL Server 2008 and Microsoft Windows Server 2008 operating system.
HP DButil can be downloaded at no charge from the following site:
http://h20000.www2.hp.com/bizsupport/TechSupport/SoftwareDescription.jsp?lang=en&cc=us&swItem=co-62583-1&jumpid=reg_R1002_USEN.

HP Insight Control Storage Module for vCenter

Overview

HP Insight Control Storage Module for vCenter allows customers who are using vCenter to better monitor and manage the storage associated with VMware virtual machines. HP can be added to vCenter, allowing vCenter administrators to list LUN/volume connections, determine the storage attributes associated with virtual machines, and monitor the status and health of the arrays.

Features and Benefits:

1. Monitor the status and health of HP arrays: Administrators managing their virtual machine environment can get additional information about the health and status of their HP arrays. This information helps in diagnosing problems, and communicating with storage administrators on the various storage requirements for the virtualized environment.
2. Manage LUN / volume connections from VMs and ESX servers to the arrays: As administrators manage virtual machines, it is often very important that they know exactly what storage is connected to each, and the location and attributes of that storage within the SAN. This allows for much more intelligent decisions about VM movement and placement, and also an increased understanding of what kind of storage is being used.
3. Understand which storage features are available: Often when allocating storage for a virtual machine administrators need to match the characteristics of the VM with the attributes of the storage. A great example is that a "critical" VM would need highly available storage, whereas a "temp" VM could use non-protected storage. This feature will tell the administrators what "type" of storage is available to simplify their communication with the storage administrator (or to easily make the change themselves in smaller businesses).

For more information on the HP Insight Control Storage Module for vCenter please see the product QuickSpec at: http://h18004.www1.hp.com/products/quickspecs/14108_div/14108_div.html

SW download available on SW Depot:
https://h20392.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=HPVPR

Mainframe-Connect Tools

The following XP P9000 mainframe software products a wide range of functionality when a XP P9500 Storage is deployed in mainframe-connect environments.

HP XP P9000 Smart Manager for Mainframe

Overview

HP XP P9000 Smart Manager for Mainframe provides centralized management of Smart Tiers volumes in a mainframe environment. It works together with Smart Tiers to help mainframe users conveniently and easily manage the location of volumes by tier. It allows mainframe storage administrators to transparently manage the location of volumes in a Smart Tiers pool such that SLA requirements can be satisfied. With Smart Manager for Mainframe your storage resources can be further optimized and efficiently utilized.

Models

HP XP P9000 Smart Mgr for MF Frame LTU TB591A

Product Highlights

- Smart Tiers management of z/OS for mainframe volumes.
- Recognizes z/OS DASD based on VOLSER, Storage Group and z/OS device numbers.
- Transparent migration - no need to disrupt or quiesce applications

Support

See Service & Support section

Prerequisites

- **Software**
  - HP XP P9000 Thin Provisioning
  - HP XP P9000 Smart Tiers
- **Operating System**
  - IBM z/OS (required)

Licensing

A frame license is available for XP P9500 Storage.

HP XP P9000 for Data Exchange

Overview

HP XP P9000 for Data Exchange Software allows seamless data exchange between mainframe and open systems hosts. It provides management of data format and code conversions, and allows information sharing across computing platforms.

Models

Models HP XP P9000 for Data Exchange Software LTU T1620AE

Product Highlights

- Mainframe and open systems data managed and stored on single XP P9500 Storage
- Automatic data format and code conversions
- Supports HP UX, Windows, Linux, Sun Solaris, and AIX Operating Systems

Support

See Service & Support section

Licensing

License-to-use on a per server basis (per server connected to one XP P9000 Storage). One License required for each server running XP P9000 for Data Exchange Software.

Mainframe-Connect Tools

Hitachi Virtual Logical Volume Image (VLVI) Manager for Mainframe

Overview Hitachi VLVI Manager improves data access performance by reducing logical device contention and host I/O queue times, particularly when several frequently accessed files are located on the same volume. It enables better utilization of the physical storage capacity of the XP P9500 Storage, and reduces the amount of administrative effort required to balance I/O workloads. On the XP P9500 Storage, Hitachi VLVI Manager formats one or more of the LDEVs on a selected volume into free space. That free space on the resulting volume can either be used to install one or more variable-sized custom volumes, or left as free space for future use.

Models Included with HP XP P9000 Array Manager - see section for more information

Support See Service & Support section

Licensing

- XP P9500 Storage: Included with HP XP P9000 Array Manager - see section for more information

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Business Copy for Mainframe

Overview Provides local multi-mirroring for mainframe volume types.

Models Included with HP XP P9000 Business Copy - see section for more information

Support See Service & Support section

Licensing

- XP P9500 Storage: Included with HP XP P9000 Business Copy - see section for more information

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Continuous Access Synchronous for Mainframe

Overview Provides Synchronous copy mode remote mirroring for mainframe volume types.

Models Included with HP XP P9000 Continuous Access Synchronous, and XP P9000 Continuous Access Journal - see section for more information.

Support See Service & Support section

Licensing

- XP P9500 Storage: Included with HP XP P9000 Continuous Access Synchronous, and XP P9000 Continuous Access Journal - see section for more information

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Continuous Access Journal for Mainframe

Overview Provides asynchronous journal-based remote mirroring for mainframe volume types.

Models Included with HP XP P9000 Continuous Access Journal Software.

Support See Service & Support section

Prerequisites

- **Software**
  - Business Continuity Manager (Recommended in a z/OS environment. Business Continuity Manager enables the following functions: Remote Business Copy at-time split with Continuous Access Journal for Mainframe, maintenance of data consistency across Continuous Access Journal for Mainframe journal groups, automatic three-site disaster recovery failover, and other automation capabilities.)

Licensing

- XP P9500 Storage: Included with HP XP P9000 Continuous Access Journal - see section for more information

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Mainframe-Connect Tools

Cache Residency Manager for Mainframe (also known as Cache LUN for Mainframe and Hitachi FlashAccess for Mainframe)

Overview Provides LDEV Cache residency for mainframe volume types.

Models Included with HP XP P9000 Array Manager - see section for more information

Support See Service & Support section

Licensing
- XP P9500 Storage: Included with HP XP P9000 Array Manager - see section for more information

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HP XP P9000 for Compatible Parallel Access Volumes (PAV)

Overview Enables high performance concurrent access of mainframe volumes by permitting a mainframe host system to issue multiple I/O requests in parallel to individual logical devices within the XP P9500 Storage.

Models

HP XP P9000 for Compatible Parallel Access Volumes Software Base LTU	TB537AA
HP XP P9000 for Compatible PAV Software 1TB 0-30TB LTU	TB537AB
HP XP P9000 for Compatible PAV Software 1TB 31-50TB LTU	TB537AC
HP XP P9000 for Compatible PAV Software 1TB 51-100TB LTU	TB537AD
HP XP P9000 for Compatible PAV Software 1TB 101-250TB LTU	TB537AE
HP XP P9000 for Compatible PAV Software 1TB 251-500TB LTU	TB537AF
HP XP P9000 for Compatible PAV Software 1TB Over 500TB LTU	TB537AG
HP XP P9000 for Compatible PAV Software 1TB-Day Meter LTU	TB537AM

Support See Service & Support section

Licensing
- For XP P9500 Storage: Licensing based on total used mainframe LDEV capacity.
- See Capacity-Licensed XP P9000 Software section

HP P9000 XP for Compatible Hyper PAV Software

Overview Greatly reduces the number of PAV aliases needed per logical subsystem while maintaining response times. PAV aliases are only bound to PAV bases for the duration of a single I/O operation, thus reducing the number of aliases needed.

Models

HP XP P9000 for Compatible Hyper PAV Software LTU	TB536A

Support See Service & Support section

Prerequisites
- **Software**
  - HP XP P9000 for Compatible Parallel Access Volumes (required)

Licensing Licensed on a per array basis

Mainframe-Connect Tools

Hitachi Logical Volume Divider for Mainframe (also known as Dataset Replication for Mainframe)

Overview Operates together with Business Copy for Mainframe. Logical Volume Divider rewrites the OS management information and dataset names and creates a user catalog for Business Copy target volumes after a split operation.

Models Included with HP XP P9000 for Business Continuity Manager - see section for more information.

Support See Service & Support section

Prerequisites

- **Software**
  - Business Copy for Mainframe (required - included with HP XP P9000 Business Copy for the XP P9500 Storage)

Licensing Licensed on a per array basis

HP XP P9000 for Compatible Extended Remote Copy (XRC)

Overview Provides asynchronous remote copies using IBM's System Data Mover on the mainframe host with IBM's XRC (Extended Remote Copy). Required for IBM GDPS/XRC implementations.

Models

HP XP P9000 for Compatible Extended Remote Copy Software Base LTU	TB538AA
HP XP P9000 for Compatible Extended Remote Copy SW 1TB 0-30TB LTU	TB538AB
HP XP P9000 for Compatible Extended Remote Copy SW 1TB 31-50TB LTU	TB538AC
HP XP P9000 for Compatible Extended Remote Copy SW 1TB 51-100TB LTU	TB538AD
HP XP P9000 for Compatible Extended Remote Copy SW 1TB 101-250TB LTU	TB538AE
HP XP P9000 for Compatible Extended Remote Copy SW 1TB 251-500TB LTU	TB538AF
HP XP P9000 for Compatible Extended Remote Copy SW 1TB Over 500TB LTU	TB538AG
HP XP P9000 for Compatible Extended Remote Copy SW 1TB-Day Meter LTU	TB538AM

Support See Service & Support section

Licensing

- Licensing on one XP P9500 Storage based on total capacity of XRC P-VOLs. Also, add the total capacity of the XRC S-VOLs on the array if reverse copy will be used for recovery operations.
- See Capacity-Licensed XP P9000 Software section

Mainframe-Connect Tools

HP XP P9000 for FlashCopy Mirroring

Overview

HP XP P9000 for FlashCopy Mirroring Software provides snapshot capability for local copy of mainframe volumes. It enhances data availability for mainframe data and improves productivity by providing IBM FlashCopy compatible point-in-time copies within an HP XP P9500 Storage. As soon as a copy is created, it becomes available for use. The copy can be either virtual or physical. If a virtual copy is specified, it remains a pointer-based copy that only saves the changes from the original. However, if a physical copy is specified, a full copy will be completed in the background while both the source and the copy remain available for access.

For additional availability, FlashCopy can be combined with Business Copy for Mainframe, Continuous Access Synchronous for Mainframe, Continuous Access Journal for Mainframe, and HP XP P9000 for Compatible Extended Remote Copy.

FlashCopy Space Efficient - Storage space required by copies can be saved with FlashCopy Space Efficient. FlashCopy SE uses space based on actual data being copied, not based on the P-VOL size, thus reducing the physical size required for S-VOLs.

Models

HP XP P9000 for Compatible FlashCopy Mirroring Software Base LTU	TB540AA
HP XP P9000 for Compatible FlashCopy Mirroring SW 1TB 0-30TB LTU	TB540AB
HP XP P9000 for Compatible FlashCopy Mirroring SW 1TB 31-50TB LTU	TB540AC
HP XP P9000 for Compatible FlashCopy Mirroring SW 1TB 51-100TB LTU	TB540AD
HP XP P9000 for Compatible FlashCopy Mirroring SW 1TB 101-250TB LTU	TB540AE
HP XP P9000 for Compatible FlashCopy Mirroring SW 1TB 251-500TB LTU	TB540AF
HP XP P9000 for Compatible FlashCopy Mirroring SW 1TB Over 500TB LTU	TB540AG
HP XP P9000 for Compatible FlashCopy Mirroring SW 1TB-Day Meter LTU	TB540AM
HP XP P9000 for Compatible FlashCopy Space Efficient Software Base LTU	TB541AA
HP XP P9000 for Compatible FlashCopy Space Efficient SW 1TB 0-30TB LTU	TB541AB
HP XP P9000 for Compatible FlashCopy Space Efficient SW 1TB 31-50TB LTU	TB541AC
HP XP P9000 for Compatible FlashCopy Space Efficient SW 1TB 51-100TB LTU	TB541AD
HP XP P9000 for Compatible FlashCopy Space Efficient SW 1TB 101-250TB LTU	TB541AE
HP XP P9000 for Compatible FlashCopy Space Efficient SW 1TB 251-500TB LTU	TB541AF
HP XP P9000 for Compatible FlashCopy Space Efficient SW 1TB Over 500TB LTU	TB541AG

Support

See Service & Support section

Licensing

See Capacity-Licensed XP P9000 Software section. Thin Provisioning for Mainframe is a pre-requisite for FlashCopy Space Efficient.

Mainframe-Connect Tools

HP XP P9000 for Business Continuity Manager

Overview

HP XP P9000 for Business Continuity Manager provides centralized and automated management of Business Copy for Mainframe, Continuous Access Synchronous for Mainframe, , and Continuous Access Journal for Mainframe.

XP P9000 Business Continuity Manager includes Business Continuity Manager Extended CT Group functionality, allowing you to maintain data consistency within and across multiple XP P9000 Storage for Continuous Access Synchronous for Mainframe operations. XP P9000 Business Continuity Manager also includes Logical Volume Divider (also known as Dataset Replication for Mainframe).

Models

HP XP P9000 for Business Continuity Manager Server Software LTU	TB553A
HP XP P9000 for Business Continuity Manager Software Base LTU	TB554AA
HP XP P9000 for Business Continuity Manager Software 1TB 0-30TB LTU	TB554AB
HP XP P9000 for Business Continuity Manager Software 1TB 31-50TB LTU	TB554AC
HP XP P9000 for Business Continuity Manager Software 1TB 51-100TB LTU	TB554AD
HP XP P9000 for Business Continuity Manager Software 1TB 101-250TB LTU	TB554AE
HP XP P9000 for Business Continuity Manager Software 1TB 251-500TB LTU	TB554AF
HP XP P9000 for Business Continuity Manager SW 1TB Over 500TB LTU	TB554AG
HP XP P9000 for Business Continuity Manager SW 1TB-Day Meter LTU	TB554AM

Support

See Service & Support section

Prerequisites

- Operating System
  - IBM z/OS (required)

NOTE: Business Continuity Manager is only supported in z/OS environments. Other mainframe environments, like IBM z/VM, IBM z/VSE, and non-IBM operating systems are not supported.

Licensing

- One TB553A Server LTU for each server connected to a XP P9500 or XP Disk Array controlled by Business Continuity Manager.
- For XP P9000 Storage: TB554AA/AB/AC/AD/AE/AF/AG licensed on one XP P9500 or XP Disk Array, based on total capacity of the P-VOLs associated with Business Copy for Mainframe, Continuous Access Synchronous for Mainframe, and Continuous Access Journal for Mainframe. S-VOLs are not included in the total. For multiple arrays managed under the same Business Continuity Manager, sum all of the Business Copy for Mainframe, Continuous Access Synchronous for Mainframe, and Continuous Access Journal for Mainframe P-VOLs for all of the arrays and purchase the licenses based on the overall total (unlike other XP P9000 software licenses which are licensed per array). See Capacity-Licensed XP P9000 Software section.

Mainframe-Connect Tools

Business Continuity Manager Extended CT Group

Overview Business Continuity Manager Extended CT Group allows the user to maintain data consistency within and across multiple XP P9500 Storage for Continuous Access Synchronous for Mainframe remote replication operations.

Models Included in HP XP P9000 for Business Continuity Manager - see section for more information.

Support See Service & Support section

Prerequisites

- **Software**
  - HP XP P9000 for Business Continuity Manager (required)
  - Continuous Access Synchronous for Mainframe (required - included with HP XP P9000 Continuous Access Sync, and Journal for the XP P9500 Storage.

Licensing See Capacity-Licensed XP P9000 Software section.

HP XP P9000 for Business Continuity Manager Continuous Access Journal 4x4 Ext CTG

Overview HP XP P9000 for Business Continuity Manager Continuous Access Journal 4x4 Ext CTG Software allows the user to maintain data consistency within and across multiple (up to four) XP P9500 Storage for Continuous Access Journal for Mainframe operations.

Models

HP XP P9000 Business Continuity Manager Continuous Access Journal 4x4 Ext CG SW Base LTU	TB556AA
HP XP P9000 for Business Continuity Manager Continuous Access Journal 4x4 Ext CG SW 1TB 0-30TB LTU	TB556AB
HP XP P9000 for Business Continuity Manager Continuous Access Journal 4x4 Ext CG SW 1TB 31-50TB LTU	TB556AC
HP XP P9000 for Business Continuity Manager Continuous Access Journal 4x4 Ext CG SW 1TB 51-100TB LTU	TB556AD
HP XP P9000 for Business Continuity Manager Continuous Access Journal 4x4 Ext CG SW 1TB 101-250TB LTU	TB556AE
HP XP P9000 for Business Continuity Manager Continuous Access Journal 4x4 Ext CG SW 1TB 251-500TB LTU	TB556AF
HP XP P9000 for Business Continuity Manager Continuous Access Journal 4x4 Ext CG SW 1TB Over 500TB LTU	TB556AG
HP XP P9000 for Business Continuity Manager Continuous Access Journal 4x4 Ext CG SW 1TB-Day Meter LTU	TB556AM

Support See Service & Support section

Prerequisites

- **Software**
  - HP XP P9000 for Business Continuity Manager (required)
  - Continuous Access Journal for Mainframe (required - included with XP P9000 HP Continuous Access Journal

Licensing

- For XP P9500 Storage: TB556AA/AB/AC/AD/AE/AF/AG licensed on one XP P9500, based on total capacity of the P-VOLs associated with Continuous Access Journal for Mainframe. For multiple arrays managed under the same Business Continuity Manager, sum all of the Continuous Access Journal for Mainframe P-VOLs for all of the arrays and purchase the licenses based on the overall total (unlike other XP P9000 software licenses that are licensed per array). See Capacity-Licensed XP P9000 Software section.

Mainframe-Connect Tools

HP XP P9000 for Compatible High Perf FICON(R) Connectivity Software

Overview	High Performance FICON for system z or zHPF is an enhancement of the FICON channel architecture; which also means compatibility with certain standards such as Fibre Channel Physical and Signaling standard (FC-FS), Fibre Channel Switch Fabric and Switch Control Requirements (FC-SW), and Fibre Channel Single-Byte-4 (FC-SB-4) standards. Enhancements have been made to the z/Architecture® and the FICON interface architecture to deliver improvements for online transaction processing (OLTP) workloads. zHPF is implemented exclusively in System z10. When High Performance FICON is exploited by the FICON channel, the z/OS operating system, and the control unit; the FICON channel overhead will be reduced. This is achieved by simplification of the protocol, and by reducing the number of information units processed, resulting in more efficient use of the fiber link.	
Models	HP XP P9000 for Compatible High Perf FICON (R) Connectivity SW LTU	TB517A
Support	See Service & Support section	
Licensing	A frame license is provided for XP P9500 Storage.	

Capacity-licensed XP P9000 Software

Capacity-licensed XP P9000 Software

Many XP P9000 software titles are licensed based on some measure of the storage capacity of the system. This structure allows customer costs for software to scale with the cost for their hardware solution. In all cases, a 1TB increment is the smallest increment available. Therefore, for all capacity requirement calculations, capacity figures should be rounded up to the next highest TB. The capacity-licensed XP P9000 Software products are licensed using a "band" structure.

Band-based Capacity-licensed XP P9000 Software Product Structure

Band-based capacity-licensed XP P9000 Software licenses are ordered in 1TB increments only, with different 1TB license types corresponding to each of the capacity "band" product numbers of the software product structure:

Description	Product Number
Base License	TB5xxAA
1TB increment, 0TB to 30TB	TB5xxAB
1TB increment, 31TB to 50TB	TB5xxAC
1TB increment, 51TB to 100TB	TB5xxAD
1TB increment, 101TB to 250TB	TB5xxAE
1TB increment, 251TB to 500TB	TB5xxAF
1TB increment, Over 500TB	TB5xxAG

Customers purchase the Base License and then purchase all capacity licenses under a fixed schedule depending on the license capacity required. All capacity figures should be rounded up to the nearest TB. Purchase of capacity-based software falls into two categories:

- **New Software purchase**: Software licenses are being purchased along with a new XP P9500 Storage or for a new software purchase for an existing XP P9500 Storage implementation.
- **License Capacity upgrade purchase**: A customer is adding usable storage capacity to their system or expanding the use of certain software titles, requiring that they expand the license capacity by purchasing additional LTU products.

NOTE: Because of the band pricing structure, if your configuration is near the top of a band, compare the price of the entry point of the next higher band to see if it might provide a lower price. For example, consider 30TB of XP P9000 Array Manager. 30TB is at the top of the first band. If you move up to the next band and buy 31TB instead, you will find that the price for 31TB is actually lower than the price for 30TB.

For new software purchase:

Purchase the Base License and then purchase all capacity licenses from the capacity band that matches the total capacity required.

Example: Customer purchases an 18TB raw capacity XP P9500 Storage. Consider that total usable capacity, based on the capacity of all configured LDEVs, is 12TB. Customer wants HP XP P9000 Auto LUN. In this case, customer will need to purchase 12TB of Auto LUN LTUs. To provide for 12TB license capacity for the software, the customer would order the following:

Quantity	Description	Product Number
1	HP XP P9000 Auto LUN Software Base LTU	TB515AA
12	HP XP P9000 Auto LUN Software 1TB 0-30TB LTU	TB515AB

Capacity-licensed XP P9000 Software

For license capacity upgrades:

The customer purchases additional license product from the band that matches the sum of the currently installed capacity plus the desired upgrade capacity.

Example: Customer has a 26.5TB usable capacity system with existing 27TB installed license capacity of XP P9000 Auto LUN. They then install more drives and configure 4 TB additional usable capacity (bringing the total usable storage capacity of the array up to 30.5 TB). In this case, the customer requires at least 3.5 TB (30.5 TB - 27 TB) additional license capacity of XP P9000 Auto LUN in order to "cover" the new total usable capacity of the array. Rounding 3.5 TB up to the nearest TB, they customer needs to purchase 4 TB license capacity for a total of 31 TB. Because the total capacity is 31 TB, the upgrade capacity is purchased from the 31 to 50 TB band

Quantity	Description	Product Number
4	HP XP P9000 Auto LUN Software 1TB 31-50TB LTU	TB515AC

Usable Capacity-licensed Software Titles

For usable capacity-licensed titles, customers license the use of the software by purchasing License products that "cover" them for the amount of total usable storage capacity present on their array (i.e. for the total capacity of all the LDEVs configured in the array). In other words, usable capacity is based upon the total usable capacity of all created LDEVs

Total Usable Capacity = Allocated LDEVs + Unallocated LDEVs + Reserved Capacity. Note that Usable Capacity for software licenses is to be calculated in binary (TiB). A factor of 1024 is to be used for converting from raw to usable capacity.
Example: Customer has a XP P9500 Storage with 100TB physical raw capacity. The entire raw capacity has been configured as RAID 1. Thus, the total effective capacity available to customer is 50TB. Customer configures a number of LDEVs whose total capacity equals 40TB. This 40TB will be considered as the "usable" capacity of the array. All software titles licensed on usable capacity will need to have 40TB licenses if they need to be used on this array.

Note that if a customer crosses the boundary by creating too many LDEV's, they can restore management to the array by deleting LDEVs until they are back below the licensed threshold again. It is not necessary to de-install array groups to correct exceeding the licensed capacity.

The following XP P9000 Family Software Titles are licensed based on the usable storage capacity of the array:

- HP XP P9000 Command View AE
  - There is no need to include the configured usable capacity of External Storage LUNs.
- HP XP P9000 Tiered Storage Manager
  - Must also include license capacity for the configured usable capacity of any External Storage LUNs attached to the XP P9500 Storage.
- HP XP P9000 Array Manager (includes Hitachi VLVI Manager for Mainframe, , Data Retention Utility, Cache Residency Manager, Cache Residency for Mainframe, Volume Shredder, Performance Monitor, XP P9000 RAID Manager, and XP P9000 Cache Partition).
- HP XP P9000 External Storage (Capacity must be purchased to cover the usable LUN's configured as external storage)
- HP XP P9000 Auto LUN
  - There is no need to include the configured usable capacity of External Storage LUNs.
- HP XP P9000 Performance Advisor
  - There is no need to include the configured usable capacity of External Storage LUNs.
- HP XP P9000 Cache Residency Manager (includes Cache Residency for Mainframe)
- Hitachi VLVI Manager for mainframe
- Cache Residency for Mainframe

For these titles, customers license the use of the software by purchasing License products that "cover" them for the amount of usable

storage capacity present on their array (i.e. for the total capacity of all the configured LDEVs in the array excluding spare drives).

NOTE: The XP P9500 Storage can be configured as an external storage controller with large quantities of externally attached storage. In this case, the XP P9500 Storage has 5 drives in it. In order to turn on the function of a usable-capacity licensed title, you must install the software with enough licenses to "cover" for the internal usable capacity of the array.

Used Capacity-licensed Software Titles

The following XP P9000 Family Software Titles are licensed based on the amount of storage actually employed by the Software:

- HP XP P9000 Replication Manager (Licensed capacity must be greater than or equal to the sum of the purchased license capacities of the following replication products installed on that array: HP XP P9000 Business Copy, HP XP P9000 Continuous Access Sync, and HP XP P9000 Continuous Access Journal)
- HP XP P9000 Thin Provisioning (licensed on the capacity of the thin provisioning pool). Includes Thin Provisioning for Mainframe.
- HP XP P9000 Smart Tiers (licensed on the capacity of the thin provisioning pool that is managed by Smart Tiers)
- Data Retention Utility
- HP XP P9000 Continuous Access Synchronous (includes Continuous Access Synchronous for Mainframe)
  o Used capacity = Continuous Access Synch P-Vols and S-Vols plus Continuous Access Synch for Mainframe P-Vols and S-Vols
- HP XP P9000 Continuous Access Journal (includes Continuous Access Journal for Mainframe)
  o Used capacity = Open Systems P-Vols and S-Vols plus Mainframe P-Vols and S-Vols.
  o Only P-Vols and S-Vols are counted when determining license quantity. Capacity used for journal volumes is not counted.
- HP XP P9000 Business Copy (includes Snapshot XP P9000 feature and Business Copy for Mainframe)
  o Used capacity = Business Copy P-Vols and S-Vols, plus Business Copy for Mainframe P-Vols and S-Vols, plus Snapshot P-Vols and Pool-Vols.
- Continuous Access Synchronous for Mainframe
- Business Copy for Mainframe
- HP XP P9000 for Compatible Parallel Access Volumes (PAV) - licensed on total used mainframe LDEV capacity. This is the sum of total capacity of mainframe base LDEVs (data volumes) that will be defined with ALIASES via the Remote Web Console at the time PAV is installed, and base volumes that are accessed by Hyper PAV (if HyperPAV is installed).
- HP XP P9000 for FlashCopy Mirroring
- HP XP P9000 for FlashCopy Space Efficient
- HP XP P9000 for Compatible Extended Remote Copy (XRC) (total capacity of XRC P-VOLs. Also, add the total capacity of XRC S-VOLs if reverse copy will be used for recovery operations.)
- HP XP P9000 for Business Continuity Manager (total capacity of the P-VOLs associated with Business Copy for Mainframe, Continuous Access Synchronous for Mainframe, and Continuous Access Journal for Mainframe for all XP P9000 Disk Arrays managed under the same Business Continuity Manager)
- Hitachi Business Continuity Manager Extended CT Group (total capacity of the P-VOLs associated with Continuous Access Synchronous for Mainframe for all of the arrays managed under the same Business Continuity Manager)
- HP XP P9000 for Business Continuity Manager Continuous Access Journal 4x4 Ext CG (total capacity of the P-VOLs associated with Continuous Access Journal for Mainframe for all of the arrays managed under the same Business Continuity Manager.
  For these titles, customers license the use of the software by purchasing License products that "cover" them for the amount of storage capacity actually used by the software title in question.

  NOTE: For the following product bundles, individual titles are licensed based on Usable or Used capacity depending on how they are licensed separately:

- HP XP P9000 Array Mgr With Thin Provisioning Software - When purchased as an upgrade to installed capacity, select the band that includes the quantity that is the sum of MINIMUM(Array Manager installed capacity, Thin Provisioning installed capacity) + new Array Manager with Thin Provisioning capacity.
- HP XP P9000 External Storage with Thin Provisioning Software - When purchased as an upgrade to installed capacity, select the band that includes the quantity that is the sum of MINIMUM(External Storage installed capacity, Thin Provisioning installed

capacity) + new External Storage with Thin Provisioning capacity.

Meter-based Term Licenses

Meter-based Term Licenses are available for the following software titles:

- HP XP P9000 Array Manager Software
- HP XP P9000 Thin Provisioning Software
- HP XP P9000 Array Manager With Thin Provisioning Software
- HP XP P9000 External Storage Software
- HP XP P9000 External Storage with Thin Provisioning Software
- HP XP P9000 Smart Tiers Software
- HP XP P9000 Continuous Access Synchronous Software (includes Continuous Access Synchronous for Mainframe)
- HP XP P9000 Continuous Access Journal (includes Continuous Access Journal for Mainframe)
- HP XP P9000 Business Copy (includes Snapshot XP P9000 feature and Business Copy for Mainframe)
- HP XP P9000 Auto LUN Software
- HP XP P9000 Command View Advanced Edition Software
- HP XP P9000 Tiered Storage Manager Software
- HP XP P9000 Performance Advisor Software
- HP XP P9000 for Compatible Parallel Access Volumes Software
- HP XP P9000 for Compatible Extended Remote Copy Software
- HP XP P9000 for Compatible FlashCopy Mirroring Software
- HP XP P9000 for Business Continuity Manager Software
- HP XP P9000 Bus Continuity Manager/Continuous Access Journal 4x4 Ext CG Software

Regular band SKUs continue to be available for the above products. The products continue to be licensed based on capacity (Usable or Used as the case may be). Meter-based Term licenses can be used together with the regular band SKUs.

Meter-based Term licenses can be used only for XP P9500 Storage. To use Meter-based Term licenses for any product, it is necessary to install Base license and 1TB Permanent license of that product first on the array.

Example: A new XP P9500 customer expects their average storage capacity usage to be 100TB, fully Thin Provisioned. Additionally they want Performance Advisor (100TB), Business Copy (50TB) and Continuous Access Synchronous (40TB). Also, every year, in the month of December, they expect their storage requirements to go up by 20% and drop down to normal post December. What should they order?

For steady state condition, customer can order Permanent licenses:

- 100TB LTU of Array Manager+ThP: 1 x TB524AA, 101 x TB524AE
- 100TB LTU of Performance Advisor: 1 x TB590AA, 101 x TB590AE
- 50TB of Business Copy: 1 x TB513AA, 51 x TB513AD
- 40TB of Continuous Access Synchronous: 1 x TB511AA, 40 x TB511AC

For yearend peak, customer can order Meter-Based Term licenses to cover the month of December:

- 31*20 = 620TB-Days of Array Manager+ThP: 620 x TB524AM
- 31*20 = 620TB-Days of Performance Advisor: 620 x TB590AM
- 31*10 = 310TB-Days of Business Copy: 310 x TB513AM
- 31*8 = 248TB-Days of Continuous Access Synchronous: 248 x TB511AM

Capacity-licensed XP P9000 Software

Example: An existing XP P9500 customer needs to attach an EVA to their XP P9500 Storage for a special project. The duration of the project is expected to be 180 days. The total usable capacity of the LUNs hosted on the EVA will be 5TB. What should the customer order?

As this is a time-based project, Meter-Based Term licenses are recommended. Suggested configuration:

- 1 x TB506AA (External Storage Base license)
- 1 x TB506AB (Ext Storage SW 1TB 0-30TB LTU)
- 720 x TB506AM (Ext Storage 1TB-Day Meter LTU)
- Out of 5TB total licensing requirement, 1TB is covered with Permanent LTU and 4TB is covered with Meter licenses. 4TB LTU for 180 Days = 720 TB-Days Meter LTU.

Note that to use Meter-based Term licenses, customer needs to have Base license and 1TB Permanent license installed on the array.

For HP XP P9000 External Storage:	Used capacity is defined as the total capacity of all logical volumes that are physically hosted on/mapped to an external storage subsystem (e.g. MSA, EVA, and XP Disk Arrays). This amount represents the true usable capacity of these volumes corresponding with the configured LDEV sizes (i.e. it excludes RAID mirroring overhead). **Example:** A customer wishes to deploy a XP P9500 Storage. The customer wishes to use HP XP P9000 External Storage to host a portion of the data on an externally connected EVA storage system. For their solution, they determine that they will host 140 LUNs of equal LDEV size on the EVA. Each LUN LDEV is roughly 14.5 GB in size. The customer must purchase license capacity to cover all the LUNs being hosted on the EVA. In this case, the total used capacity would be calculated as follows: • Used Capacity = logical capacity of all externally hosted volumes = 140 x 14.5 GB = 2,030 GB. Dividing by 1024 to convert to TB gives 1.98 TB. Rounded to the next highest TB: 2 TB of External Storage license capacity is required
For Data Retention Utility, Volume Retention Manager for Mainframe:	Used capacity is defined as the amount of logical storage capacity on the array that is managed by the software. Logical storage capacity is defined as the size of the LDEV capacity being managed by the software. Example: Customer wants to use Data Retention Utility to manage a total of 2.5 TB of logical storage capacity. Rounding up to the nearest TB, the customer would order a total of 3 TB license capacity

Capacity-licensed XP P9000 Software

For HP XP P9000 Continuous Access Software, Continuous Access Synchronous for Mainframe, Continuous Access Journal for Mainframe:

Used capacity is defined as the total capacity of all logical volumes that are Remote Mirroring P-Vols (source volumes on a primary XP P9500 Storage) or S-Vols (copy volumes on a secondary XP P9500 Storage). This amount represents the true usable capacity of these volumes corresponding with the configured LDEV sizes (i.e. the amount excludes RAID mirroring overhead).

Example: Based upon their total storage need, a customer requires a primary XP P9500 Storage with 5TB raw capacity. The customer also requires XP P9000 Continuous Access for the purpose of deploying a disaster recovery solution. For their solution, they determine that they will mirror 70 LUNs of equal LDEV size to a secondary XP P9500 Storage in their remote data center. Each LUN LDEV is roughly 14.5 GB in size. Each source LUN is a P-Vol and each copy LUN is an S-Vol. On both the primary and secondary, the customer must purchase license capacity to cover all LUNs being managed as XP P9000 Continuous Access P-Vols plus S-Vols. In this case, the total used capacity would be calculated as follows:

- On the Primary array: Used Capacity = P-Vol (source) LUNs = 70 x 14.5-GB = 1,015 GB. Dividing by 1024 to convert to TB gives 0.99 TB. Rounded up to the next highest TB: 1 TB total used capacity
- On the Secondary array: Used Capacity = S-Vol (copy) LUNs = 70 x 14.5-GB = 1,015 GB. Dividing by 1024 to convert to TB gives 0.99 TB. Rounded up to the next highest TB: 1 TB total used capacity

Therefore, for the primary and secondary XP P9000s, the customer must purchase at least 1 TB worth of license capacity on each array.

For HP XP P9000 Business Copy and Business Copy for Mainframe

Used capacity is defined as the total capacity of all logical volumes that are either Local Copy P-Vols (BC source) or traditional S-Vols (BC copy) or POOL-Vols (where Snapshot data is stored). This amount represents the true usable capacity of these volumes corresponding with the configured LDEV sizes (i.e. it excludes RAID mirroring overhead).

Example: Based upon their total storage need, a customer requires a 5 TB raw capacity XP P9500 Storage. The customer also requires XP P9000 Business Copy for the purpose of online backup and application testing and all of the copy LUNs will be traditional, full-size volumes. For their solution, they determine that they will mirror 70 LUNs of equal LDEV size, with one copy each for the first 30 LUNs and two copies each for the other 40 LUNs. Each LUN LDEV is roughly 14.5 GB in size. Each source LUN is a P-Vol and each copy LUN is an S-Vol. The customer must purchase license capacity to cover all LUNs being managed as a XP P9000 Business Copy P-Vol or S-Vol. In this case, the total used capacity would be calculated as follows:

- Used Capacity = P-Vol (source) LUNs + S-Vols (copy) LUNs = 70 x 14.5-GB + 1 x 30 x 14.5-GB + 2 x 40 x 14.5-GB = 1,015 GB + 1,595 GB = 2,610 GB. Dividing by 1024 to convert to TB gives 2.55 TB. Rounded to the next highest TB: 3 TB used capacity.

For HP XP P9000 Business Copy using Snapshot replication

Used capacity is defined as the total capacity of all logical volumes that are P-Vols (Snapshot source) plus Pool Volume (where all Copy-on-Write data is stored). This amount represents the true usable capacity of these volumes corresponding with the configured LDEV sizes (i.e., it excludes RAID mirroring overhead).

The Pool Volume size is estimated by understanding:

1. the size of data that will be changed for each P-Vol per generation of Snapshot V-Vol (X)
2. the number of generations of Snapshots that will be created/retained (Y)
3. the number of P-Vols that will have Snapshots taken (Z)

The Pool volume size = XxYxZ (rounded up to the next TB)

Example: Based on a customer's total storage need, they have 300 P-Vols, each sized at 100GB (30,000GB, dividing by 1024 to convert to TB gives 29.3 TB, rounded to the next highest TB: 30TB total). The customer wants to keep 7 generations of Snapshot V-Vols. Finally, it has been estimated that 4.7GB of data will be updated between each generation. The customer must purchase license capacity to cover all LUNs being managed as a Snapshot XP P9000 P-Vol or V-Vol. In this case, the total used capacity would be calculated as follows:

- Used Capacity = P-Vol (source) LUNs + Pool volume size = 30TB + (4.7GBx7x300 = 9,870GB, dividing by 1024 to convert to TB gives 9.64 TB, rounded to the next highest TB: 10TB) for a total licensing requirement of 40TB

Snapshot requires a V-Vol management area in Shared Memory. The Shared Memory requirement for the V-Vol management area is the sum of the P-Vol information capacity requirement + the Pool Volume information capacity requirement. See the Snapshot Users Guide for complete details regarding configuring Shared Memory for Snapshot.

Shared Memory requirement for XP P9500 Storage - refer to the configuration guide to understand the Shared Memory requirements for XP P9500 Storage.

For HP XP P9000 Continuous Access Conversion:

HP XP P9000 Continuous Access Conversion licenses are used to convert an installed Continuous Access Synchronous product to Continuous Access Journal product.

Example 1: A customer with a XP P9500 Storage has 10TB of Continuous Access Sync installed and no Continuous Access Journal installed. They wish to convert 5TB of the Continuous Access Sync capacity into Continuous Access Journal. They must purchase 5TB of Continuous Access Conversion as follows:

Quantity	Description	Product Number
1	HP XP P9000 Continuous Access Conversion Software Base LTU	TB523AA
5	HP XP P9000 Continuous Access Conversion Software 1TB 0-30TB LTU	TB523AB

After installing these licenses, the XP P9000 will have 5TB of Continuous Access Journal and 5TB of Continuous Access Sync. 5TB of Continuous Access Sync has been converted to Continuous Access Journal.

Example 2: A customer has a XP P9500 Storage with 10TB of Continuous Access Sync installed and no Continuous Access Journal installed. They wish to convert all of the 10TB of Continuous Access Sync capacity into Continuous Access Journal and add 26TB more of Continuous Access Journal. They must purchase 10TB of Continuous Access Conversion and 26TB of Continuous Access Journal as follows:

Quantity	Description	Product Number
1	HP XP P9000 Continuous Access Conversion Software Base LTU	TB523AA
10	HP XP P9000 Continuous Access Conversion Software 1TB 0-30TB LTU	TB523AB
26	HP XP P9000 Continuous Access Journal Software 1TB 31-50TB LTU	TB578AC

After installing these licenses, the disk array will have 36TB of Continuous Access Journal. 10TB of Continuous Access Sync has been converted to Continuous Access Journal, and 26TB of Continuous Access Journal have been added.

Example 3: A customer has 30TB of Continuous Access Sync and 26TB of Continuous Access Journal installed. The customer needs to convert 5TB of Continuous Access Sync to Continuous Access Journal. To do that, the customer must purchase 5TB of Continuous Access Conversion to increase the license capacity of XP P9000 Continuous Access Journal from 26TB to 31TB.

Quantity	Description	Product Number
5	HP XP P9000 Continuous Access Conversion Software 1TB 31-50TB LTU	TB523AC

After installing this license, the XP P9000 will have 25TB of Continuous Access Sync and 31TB of Continuous Access Journal installed. 5TB of Continuous Access Sync have been converted to Continuous Access Journal.

For Mainframe Software bundling with Open Systems Software:

The following mainframe local and remote mirroring software titles are bundled with their open systems equivalents when ordered for the XP P9500 Storage:

- Continuous Access Synchronous for Mainframe (included with HP XP P9000 Continuous Access Synchronous)
- Continuous Access Journal for Mainframe (included with HP XP P9000 Continuous Access Journal)
- Business Copy for Mainframe (included with HP XP P9000 Business Copy)

For these products, customer must purchase license capacity to cover the total open systems and mainframe used capacity.

Example: A customer has a XP P9500 Storage with mainframe and open systems connect. They want to use HP XP P9000 Continuous Access to synchronously mirror 2 TB of open systems volumes and Continuous Access Synchronous for Mainframe to mirror 1 TB of mainframe volumes to another XP P9500 Storage. For each array, this customer requires at least 3 TB of license capacity of HP XP P9000 Continuous Access (which includes Continuous Access Synchronous for Mainframe).

Licensing for Software used with HP XP P9000 External Storage

Capacity-licensed XP P9000 Software

Usable Capacity licensed titles:

- HP XP P9000 Tiered Storage Manager: License must be purchased to cover externally attached storage capacity
- All other XP P9500 Storage usable capacity licensed software (Array Manager, Auto LUN, Performance Advisor, and Command View AE): These titles are licensed only on internal capacity of XP P9500 Storage and therefore are not affected by the presence or absence of externally attached storage.

Example: A customer wishes to deploy a XP P9500 Storage solution that will have 5TB of native XP P9500 Storage usable capacity along with an External Storage configuration. The customer intends to host 3TB of XP P9500 logical capacity on an external EVA storage system. If the customer desires to use XP P9000 Tiered Storage Manager, the customer must purchase license capacity of HP XP P9000 Tiered Storage Manager software as follows:

License Capacity requirement	= XP P9500 usable storage capacity + External storage logical capacity = 5TB + 3TB = 8TB total license capacity required for software licensing purposes

Used Capacity licensed titles:

For XP P9500 Storage:

- HP XP P9000 Business Copy (optional product)
- HP XP P9000 Continuous Access Synchronous (optional product)
- HP XP P9000 Continuous Access Journal (optional product)
- HP XP P9000 Replication Manager (optional product)

For these titles, license capacity must be purchased based on the 'standard' licensing terms for those titles. In other words, the standard licensing terms apply equally whether a given volume is being hosted on native XP P9500 Storage capacity or on the external storage device.

Example: A customer wishes to deploy a XP P9500 Storage. In addition to provisioning XP P9500 'native' drive capacity to host their main production data, the customer wishes to use HP XP P9000 External Storage to host a portion of non-production data on an externally connected EVA storage system. In the final configuration, the customer wishes to create one local copy/mirror of 2.2TB of XP P9500 logical capacity and host that copy on the EVA storage system using XP P9000 Business Copy. Per standard XP P9000 Business Copy licensing terms, the customer must purchase license capacity to cover all LUNs being managed as a XP P9000 Business Copy P-Vol or S-Vol. In this case, the total used capacity would be calculated as follows:

License Capacity requirement	= Used Capacity = P-Vol (source) LUNs + S-Vols (copy) LUNs = 2.2TB (source, hosted on the XP P9500) + 2.2TB (copy, hosted on the EVA) = 4.4TB. Rounded to the next highest TB: 5 TB used capacity for XP P9000 Business Copy

Service and Support, HP Care Pack, and Warranty Information

Warranty

Warranty level of hardware reactive support is 3 years, 24×7, 4-hour remote response with next business day time.

For more information about HP's Global Limited Warranty and Technical Support, visit http://h18004.www1.hp.com/storage/warranty.html

Service and Support

Technology Services for increased uptime, productivity and ROI
TRUST HP storage technology experts for every level of service and support. Our integrated portfolio of Services for storage help customers reduce costs, optimize data, streamline storage management, and improve backup and recovery. Capitalizing on HP Storage Systems' capabilities requires a service partner who understands your increasingly complex environment. Team with the people who know HP infrastructure hardware and software best-the experienced professionals at HP Services.

Protect your business beyond warranty
Warranty protects against manufacturer defects, however warranty uplifts, such as HP Care Pack Services protect the business-by reducing downtime risks and providing operational consistency for mission-critical and standard business computing.

What HP Storage Technology Services can do for you
HP Storage Technology Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. HP storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services.

Choose the right level of support, deployment and integration services
HP support recommendations are designed to help you enhance technology operations and lower risk-and make it easier for you to seek the right balance between affordability and service-level commitments. Depending on your individual support needs, choose from three levels of care that cover the entire lifecycle to better address your needs-Optimized Care, Standard Care, and Basic Care. If none of our support recommendations meet your needs, we can tailor a service solution for your unique support requirements. Only HP brings together deep expertise, proactive and business critical support and a strong partner network-plus, a full set of infrastructure services designed to power a Converged Infrastructure.

Optimized Care- delivers best performance and stability through deployment and proactive management practices

HP Critical Service-Designed for environments where downtime cannot be tolerated, HP monitors your environment around-the-clock, 365 days a year. We implement improvement projects to mitigate risks and reduce incidents. If outages do occur, they are addressed immediately with access to our dedicated critical support escalation resources. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-1613ENW.pdf

Plus 20 credits per year, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education.

Standard Care-maintains high level of uptime, along with expert help to cut the cost and complexity of implementation and support

HP Proactive 24 Service-This is the right choice for environments where some downtime is acceptable. HP helps manage your IT environment for improved performance, stability, and availability. Your incidents are addressed 24x7, with a maximum 4-hour onsite response 365 days a year.
http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9842EN.pdf

HP Critical Service-Designed for environments where downtime cannot be tolerated, HP monitors your environment around-the-clock, 365 days a year. We implement improvement projects to mitigate risks and reduce incidents. If outages do occur, they are addressed immediately with access to our dedicated

	critical support escalation resources. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-1613ENW.pdf **Plus 20 credits per year**, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education
Basic Care-Minimum recommended support	**HP Foundation Care 24x7 Service** -HP Foundation Care 24x7 connects you to HP 24 hours a day, seven days a week for assistance on resolving issues - hardware onsite response within four hours and software call back within two hours after opening your case. Three years' coverage recommended with HP Care Pack Service.
Implement right from the start	**Whichever level of care you select, it includes:** **HP Storage Disk Array Installation and Startup Service**-HP installs and tests your hardware and software onsite, including configuration. We deliver a custom tailored storage deployment, properly integrated into your environment. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-2345ENW.pdf
Remote Support Tools	Support Recommendations include fully integrated remote supported-core design and fabric of industry benchmark remote support systems. Site-specific data used both proactively and reactively with real-time monitoring and information extraction tools. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-4141ENW.pdf
Additional services to meet your needs	**HP Performance Analysis for the Storage XP/EVA Disk Arrays**- The service provides data collection, detailed I/O analysis and enhancement recommendations for HP 3PAR Storage disk arrays, HP EVA P6000 Storage disk arrays and HP XP P9000 Storage disk arrays. http://athp.hp.com/portal/go/5982-6668 **HP Data Replication Solution Services provides for proper implementation of Business Copy** for HP Storage SAN Virtualization Services Platform (SVSP). The service helps your customers manage and control data replication needs by implementing a custom-tailored, fully integrated and operational data replication solution within their virtualized storage environment. data sheet: HP Data Replication Solution Services for Business Copy for SVSP: http://athp.hp.com/portal/go/4AA2-9549
For more information	www.hp.com/services/storage To learn more on HP Storage Services, please contact your HP sales representative or HP Authorized Channel Partner HP Care Pack Services are sold by HP and HP Authorized Service Partners: ● Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools. ● Customers purchasing from a commercial reseller can find HP Care Pack Services at www.hp.com/go/lookuptool

Each XP P9500 can be a custom configuration. For more information, please contact your reseller or authorized HP representative to work with the requirements to configure the product correctly.

HP XP P9500 Storage	AV399A
The XP P9500 is a Structured Solution Product (SSP). This product number (AV399A) is a zero-price ordering mechanism that is used as an "umbrella" product to indicate to the ordering system that this is a new XP P9500 order	
HP XP P9500 Storage DKC Module-0 Controller Base Rack	AV400B
Includes: Controller Chassis with 1 Cache Memory Adapter pair, 1 Processor Blade pair, 1 Express Switch Adapter pair, 1 SVP, CLI/SMI-S LTU, and basic Power Supplies; Space for 2 128 slot Drive Chassis or 48 slot Flash Module Chassis	
HP XP P9500 Storage DKC Module-1 Controller Base Rack	AV401B
Includes: Controller Chassis with 1 Cache Memory Adapter pair, 1 Processor Blade pair, 1 Express Switch Adapter pair, 1 DKC Hub kit, 1 Inter-controller Cable, and basic Power Supplies; Space for 2 128 slot Drive Chassis or 48 slot Flash Module Chassis.	
HP XP P9500 Storage DKU Base Drive Rack	AV402B
Space for 3 128 slot Drive Chassis or 48 slot Flash Module Chassis.	
HP XP P9500 3-phase 24A 60Hz with Cords Power Distribution Unit	AV404A
Power Distribution Units with 2 power cords	
HP XP P9500 3-phase 16A 50Hz with Cords Power Distribution Unit	AV405A
Power Distribution Units with 2 power cords	
HP XP P9500 1-phase 24A 60Hz with Cords Power Distribution Unit	AV406A
Power Distribution Units with 4 power cords	
HP XP P9500 1-phase 32A 50Hz with Cords Power Distribution Unit	AV407A
Power Distribution Units with 4 power cords	
HP XP P9500 Base SFF (2.5-inch) Drive Chassis	AV411B
128 slot Drive Chassis without Express Switches and Power Supplies	
HP XP P9500 Complete SFF (2.5-inch) Drive Chassis	AV412B
128 slot Drive Chassis with Express Switches and Power Supplies	
HP XP P9500 60Hz DKC Controller Rack Jumper Cable Kit	AV415A
PDU Controller Chassis interconnect power cord sets.	
HP XP P9500 60Hz DKU Disk Rack Jumper Cable Kit	AV416A
PDU Drive Chassis interconnect power cord sets.	
HP XP P9500 50Hz DKC Controller Rack Jumper Cable Kit	AV417A
PDU Controller Chassis interconnect power cord sets.	
HP XP P9500 50Hz DKU Disk Rack Jumper Cable Kit	AV418A
PDU Drive Chassis interconnect power cord sets.	
HP XP P9500 China DKC Controller Rack Jumper Cable Kit	AV419A
PDU Controller Chassis interconnect power cord sets.	
HP XP P9500 China DKU Disk Rack Jumper Cable Kit	AV420A
PDU Drive Chassis interconnect power cord sets.	
HP XP P9500 8-port 2-8Gbps Fibre Channel Host Adapter	AV423B

Consists of two blades, each composed of four 2/4/8Gbps Fibre Channel Ports (FCP). Each port pre-installed with Short Wavelength SFP.

HP XP P9500 16-port 2-8Gbps Fibre Channel Host Adapter AV424B

Consists of two blades, each composed of eight 2/4/8Gbps Fibre Channel Ports (FCP). Each port pre-installed with Short Wavelength SFP.

HP XP P9500 16-port 1-4Gbps Short Wave FICON Host Adapter AV425A

Consists of two blades, each with eight 1/2/4Gbps Short Wavelength (Multi-mode) Mainframe Fibre Channel Ports (FICON).

HP XP P9500 16-port 1-4Gbps Long Wave FICON Host Adapter AV426A

Consists of two blades, each with eight 1/2/4Gbps Long Wavelength (Multi-mode) Mainframe Fibre Channel Ports (FICON).

HP XP P9500 16-port 2-8Gbps Short Wave FICON Host Adapter AV427B

Consists of two blades, each with eight 2/4/8 Gbps Short Wavelength (Multi-mode) Mainframe Fibre Channel Ports (FICON).

HP XP P9500 16-port 2-8Gbps Long Wave FICON Host Adapter AV428A

Consists of two blades, each with eight 2/4/8 Gbps Long Wavelength (Multi-mode) Mainframe Fibre Channel Ports (FICON).

HP XP P9500 8-port 10 Gbps FCoE Channel Host Adapter AV429A

Consists of two blades, each composed of four 10 Gbps FCoE Ports

HP XP P9500 8Gbps Long Wave Fibre Channel SFP Transceiver AV436A

Long Wavelength Transceiver for one port.

HP XP P9500 Processor Blade AV440B

Consists of two blades

HP XP P9500 DKC Hub Kit AV442A

Communication link between the 2nd Express Switch Adapter in DKC Module-1 Rack and the 2nd SVP in DKC Module-0 Rack.

HP XP P9500 2nd SVP High Reliability Kit AV443A

For redundant array management functions and as a communication link to a 2nd Express Switch Adapter in DKC Module-0 and the 2nd Express Switch Adapter in DKC Module-1 Rack if present.

HP XP P9500 Cache Memory Adapter AV444A

Consists of two blades to spaces to install Cache Memory Modules and the 64GB Cache Backup Memory Modules. Includes one 64GB Cache Backup Memory Module (32GB on each blade).

HP XP P9500 16GB Cache Memory Module AV447B

Consists of four 4GB DIMMs

HP XP P9500 32GB Cache Memory Module AV448B

Consists of four 8GB DIMMs

HP XP P9500 Additional 64GB Cache Backup SSD Memory Module AV451A

Consists of two 32GB SSDs

HP XP P9500 Additional 128GB Cache Backup SSD Memory Module AV452A

Consists of two 64GB SSDs

HP XP P9500 SAS DKA Drive Controller Adapter	AV455A
Consists of two blades with four Gbps SAS ports that perform the data transfer between the cache memory and drives. Encryption is supported with optional LTU.	
HP XP P9500 CHA/DKA/Cache Express Switch Adapter	AV458A
PCI Express switch that is the connection between CHA, DKA, Cache, Processors.	
HP XP P9500 Additional DKC-DKU Power Supply	AV459A
Used in both Controller Chassis and Drive Chassis	
HP XP P9500 2 DKC Inter-Controller Connecting Cable	AV460A
Cable to connect the 2nd Express Switch in DKC Module-1 Rack to the Express Switch in DKC Module-0 Rack. LTU is required.	
HP XP P9500 Standard DKC to First Drive Chassis Cable	AV461B
Cable to connect the DKC to the 1st Drive Chassis in a DKC Rack.	
HP XP P9500 High-performance DKC to First Drive Chassis Cable	AV462A
Cable to connect the 2nd DKC to the 1st Drive Chassis in a DKC Rack for High Performance configuration.	
HP XP P9500 Standard Drive Chassis to Drive Chassis Cable	AV463A
Connects the 1st Drive Chassis to the 2nd Drive Chassis, or the 2nd Drive Chassis to the 3rd Drive Chassis.	
HP XP P9500 High-performance Drive Chassis to Drive Chassis Cable	AV464A
Connects the 1st Drive Chassis to the 2nd Drive Chassis, or the 2nd Drive Chassis to the 3rd Drive Chassis for High Performance configuration.	
HP XP P9500 Standard DKU to First Drive Chassis Cable	AV465B
Connects the 1st Drive Chassis in a DKU Rack to a DKC or DKU Rack when configuring two or more racks.	
HP XP P9500 High-performance DKU Drive Rack Connection Cable	AV466A
Connects the 1st Drive Chassis in a DKU Rack to a DKC or DKU Rack when configuring two or more racks in High Performance configuration.	
HP XP P9500 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Hard Drive	AV468A
HP XP P9500 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Hard Drive	AV403A
HP XP P9500 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Hard Drive	AV477A
HP XP P9500 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Hard Drive	AV475A
HP XP P9500 900GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Hard Drive	AV476A
HP XP P9500 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Hard Drive	AV482A
HP XP P9500 300GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Hard Drive	AV483A
HP XP P9500 200GB SAS SFF (2.5-inch) Dual Port SLC Solid State Drive	AV490A
HP XP P9500 400GB SAS SFF (2.5-inch) Dual Port SLC Solid State Drive	AV491A
HP XP P9500 200GB SAS SFF (2.5-inch) Dual Port MLC Solid State Drive	AV492A
HP XP P9500 400GB SAS SFF (2.5-inch) Dual Port MLC Solid State Drive	AV493A
HP XP P9500 800GB SAS SFF (2.5-inch) Dual Port MLC Solid State Drive	AV494A
A maximum of 128 SSDs are supported in one XP P9500	
HP XP P9500 Flash Module Chassis	AV375A

48 slot complete Flash Module Chassis	
HP XP P9500 60Hz DKU Rack Flash Module Jumper Cable Kit	AV377A
Flash Module Chassis interconnect power cord sets.	
HP XP P9500 50Hz DKU Rack Flash Module Jumper Cable Kit	AV378A
Flash Module Chassis interconnect power cord sets.	
HP XP P9500 China DKU Rack Flash Module Jumper Cable Kit	AV381A
Flash Module Chassis interconnect power cord sets.	
HP XP P9500 Standard DKC to First Flash Module Chassis Cable	AV381A
Cable to connect the DKC to the 1st Flash Module Chassis in a DKC Rack.	
HP XP P9500 High-performance DKC to First Flash Module Chassis Cable	AV382A
Cable to connect the DKC to the 1st Flash Module Chassis in a DKC Rack for High Performance configuration.	
HP XP P9500 Standard Drive Chassis to Flash Module Chassis Cable	AV383A
Cable to connect a Drive Chassis to a Flash Module Chassis inside a Rack.	
HP XP P9500 High-performance Drive Chassis to Flash Module Chassis Cable	AV384A
Cable to connect a Drive Chassis to a Flash Module Chassis inside a Rack for High Performance configuration.	
HP XP P9500 Standard Drive Chassis to Flash Module Chassis Extended Cable	AV385A
Cable to connect a Drive Chassis to a Flash Module Chassis between Racks.	
HP XP P9500 High-performance Drive to Flash Module Chassis Extended Cable	AV386A
Cable to connect a Drive Chassis to a Flash Module Chassis between Racks for High Performance configuration.	
HP XP P9500 Standard Flash Module Chassis to Flash Module Chassis Cable	AV387A
Connects the 1st Flash Module Chassis to the 2nd Flash Module Chassis inside a Rack.	
HP XP P9500 High-performance Flash Module Chassis to Flash Module Chassis Cable	AV388A
Connects the 1st Flash Module Chassis to the 2nd Flash Module Chassis inside a Rack for High Performance configuration.	
HP XP P9500 Standard Flash Module Chassis to Flash Module Chassis Extended Cable	AV389A
Connects the 1st Flash Module Chassis to the 2nd Flash Module Chassis between Racks.	
HP XP P9500 High-performance Flash Module to Flash Module Chassis Extended Cable	AV390A
Connects the 1st Flash Module Chassis to the 2nd Flash Module Chassis between Racks for High Performance configuration.	
HP XP P9500 1.6TB Flash Module	AV392A
HP XP P9500 3.2TB Flash Module	AV393A

Model	**HP XP P9500 Storage**
Number of Disk Drives	5 -2048 in 1 to 6 racks (DKC racks hold 256 drives and DKU racks hold 384 drives each)

Technical Specifications

Disk Drives

Drive Specifications	1TB 7.2K	500 GB 7.2K	300 GB 10K	600 GB 10K	900 GB 10K	146 GB 15K	300 GB 15K
Raw capacity (User area)	984.62 GB*	492.31 GB*	288.21 GB*	576.43 GB*	864.64 GB*	143.76 GB*	288.20 GB*
Rotation speed	7,200 rpm	7,200 rpm	10,000 rpm	10,000 rpm	10,000 rpm	15,000 rpm	15,000 rpm
Mean latency time	4.16 ms	4.16 ms	2.99 ms	2.99 ms	2.99 ms	2.01 ms	2.01 ms
Mean seek time (Read/Write)	8.5/9.5 ms	8.5/9.5 ms	4.0/4.4 ms	3.8/4.4 ms	3.7/4.1 ms	2.9/3.3 ms	2.9/3.3 ms
Internal data transfer rate	Up to 163 MB/sec	Up to 163 MB/sec	Up to 208.6 MB/sec	Up to 253.6 MB/sec	Up to 238.8 MB/sec	Up to 242 MB/sec	Up to 242 MB/sec
Interface type	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS	Dual ported 6 Gbps SAS

SSD / Flash Modules

Drive Specifications	200 GB (SLC or MLC) SSD	400 GB (SLC or MLC) SSD	800 GB (MLC) SSD	3.2 TB Flash Module
Raw capacity (User area)	**196.92 GB***	**393.85 GB***	**787.69 GB***	**3518.4 GB***
Interface type	**Dual ported SAS**	**Dual ported SAS**	**Dual ported SAS**	

* Capacity of drives, and therefore the raw data capacity of the XP P9000, is based on 1K = 1000, not 1024. This means that 1 GB = 1,000,000,000 bytes, not (1024)3

System Capacity

575 GB - 2 PB raw
287 GB - 1.76 PB usable

RAID Level

RAID 1 (2D + 2D)
RAID 1 (4D + 4D)
RAID 5 (3D + 1P)
RAID 5 (7D + 1P)
RAID 5 (14D + 2P)
RAID 5 (28 D + 4P)
RAID 6 (6D + 2P)

Maximum number of Logical Devices (LDEVs)

65,280

Cache Memory

16 GB - 1 TB

Operating Systems

HP-UX, Open VMS, NonStop, Solaris, VMware, AIX, Windows, NetWare, IRIX, Linux, Mainframe

Host Interface

Fibre Channel, FCoE, FICON

Host Ports

8 to 128/160 by increments of 8/16

Regulatory Approvals

This product meets all applicable safety and regulatory specifications

Physical Dimensions - DKC Rack

Width x Depth x Height 24.0 x 45.1 x 79.0 in (61.0 x 114.5 x 200.6 cm)
Max Weight 1740 lb (789 kg)

Physical Dimensions - DKU Rack

Width x Depth x Height 23.6 x 45.1 x 79.0 in (60.0 x 114.5 x 200.6 cm)
Max Weight 1568 lb (711 kg)

Technical Specifications

Shipping Dimensions - DKC Rack	**Width x Depth x Height**	37.4 x 50.8 x 87.0 in (95.0 X 129.0 X 221.0 cm)
	Max Weight	1740 lb (789 kg)
Shipping Dimensions - DKU Rack	**Width x Depth x Height**	37.4 x 50.8 x 87.0 in (95.0 X 129.0 X 221.0 cm)
	Max Weight	1568 lb (711 kg)

Environmental Specifications

<table>
<tr><th colspan="4">Condition</th></tr>
<tr><th>Item</th><th>Operating[1]</th><th>Non-operation[2]</th><th>Shipping & Storage[3]</th></tr>
<tr><td>Temperature (ºC)</td><td>16 to 32</td><td>-10 to 43</td><td>-25 to 60</td></tr>
<tr><td>Relative Humidity (%)[4]</td><td>20 to 80</td><td>8 to 90</td><td>5 to 95</td></tr>
<tr><td>Max. Wet Bulb (ºC)</td><td>26</td><td>27</td><td>29</td></tr>
<tr><td>Temperature Deviation (ºC/hour)</td><td>10</td><td>10</td><td>20</td></tr>
<tr><td rowspan="5">Vibration[5]</td><td>5 to 10Hz: 0.25mm</td><td>5 to 10Hz: 2.5mm</td><td>Sine Vibration: 4.9m/s^2, 5min.</td></tr>
<tr><td rowspan="4">10 to 300Hz: 0.49m/s^2</td><td>10 to 70Hz: 4.9m/s^2</td><td rowspan="2">At the resonant frequency with the highest displacement found between 3 to 100Hz</td></tr>
<tr><td>70 to 99Hz: 0.05mm</td></tr>
<tr><td rowspan="2">99 to 300Hz: 9.8m/s^2</td><td>Random Vibration: 0.147m^2/s^3</td></tr>
<tr><td>30min, 5 to 100Hz</td></tr>
<tr><td rowspan="2">Shock</td><td rowspan="2">-</td><td rowspan="2">78.4m/s^2, 15ms</td><td>Horizontal: Incline Impact 1.22m/s</td></tr>
<tr><td>Vertical: Rotational Edge 0.15m</td></tr>
<tr><td>Altitude</td><td colspan="2">-60 to 3,000m</td><td>-</td></tr>
</table>

[1] Environmental specification for operating condition should be satisfied before the XP P9000 subsystem is powered on. Maximum temperature of 32°C should be strictly satisfied at air inlet portion. Recommended temperature range is 21 to 24°C.
[2] Non-operating conditions include both packing and unpacking conditions unless otherwise specified.
[3] On shipping/storage condition, the product should be packed with factory packing.
[4] No condensation in and around the drive should be observed under any conditions.
[5] The above specifications of vibration are applied to all three axes.

Accessories

An extensive list of accessories is available for this product; for more information, please contact your HP sales representative

Safety

This product meets all applicable safety and regulatory specifications

Technical Specifications

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The information contained herein is subject to change without notice.
The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.
For drives, 1 GB = 1 billion bytes. Actual formatted capacity is less